ISBN 978-4-902325-63-8

EXCAVATIONS AT GIRAWAD

DISTRICT ROHTAK, HARYANA, INDIA

2006

EDITED BY
Vasant Shinde, Toshiki Osada and Manmohan Kumar



Indus Project, Research Institute for Humanity and Nature, Kyoto, Japan

2011

EXCAVATIONS AT GIRAWAD

DISTRICT ROHTAK, HARYANA, INDIA

2006

EDITED BY
Vasant Shinde, Toshiki Osada and Manmohan Kumar

Indus Project, Research Institute for Humanity and Nature, Kyoto, Japan

2011

EXCAVATIONS AT GIRAWAD
DISTRICT ROHTAK, HARYANA, INDIA
2006

edited by Vasant Shinde, Toshiki Osada and Manmohan Kumar

ISBN 978-4-902325-63-8
Indus Project, Research Institute for Humanity and Nature (RIHN)
457-4 Motoyama, Kamigamo, Kita-ku, Kyoto 603-8047 Japan
Tel: +81-75-707-2371
Fax: +81-75-707-2508
E-mail: osada@chikyu.ac.jp

Printed by Nakanishi Printing Co. Ltd., Kyoto, Japan

CONTENTS

PREFACE

BY TOSHIKI OSADA
PROFESSOR, RESEARCH INSTITUTE FOR HUMANITY AND NATURE
LEADER OF THE INDUS PROJECT

I am grateful to publish the final report of excavation at Girawad, Haryana, India, as an outcome of our research project at Research Institute for Humanity and Nature (RIHN).

Our research project called officially "Environmental change and the Indus civilization" examines the social character and environmental context of the Indus civilization, and attempts to determine how they are related to the civilization's short life and rapid decline. In particular, we aim to evaluate the impact of environmental change on the subsistence economy and trade network that sustained the Indus civilization's urban system. Our research also provides data on the long-term processes of climate change in South Asia. Such data helps us develop historical perspective on, and practical understanding of, contemporary environmental problems in the region.

Our project is divided into five research groups: (1) the Palaeo-Environmental Research Group (PERG); (2) the Material Culture Research Group (MCRG); (3) the Subsistence System Research Group (SSRG); (4) the Inherited Culture Research Group (ICRG); and (5) the DNA Research Group (DNAG). The excavations were conducted mainly by MCRG. In the initial stage we had a plan to excavate three sites; e.g., Farmana in the Ghaggar region (Haryana, India), Ganweriwala in the Cholistan desert region (Punjab. Pakistan) and Kanmer in the Kachchh coastal region (Gujarat, India). We, however, abandoned excavating at Ganweriwala due to the political situation in Pakistan.

The exploration in the Ghaggar basin has been done by Professor Vasant Shinde, Deccan College, Pune, Maharashtra, India and his team in collaboration with us and Professor Manmohan Kumar, M.G. University, Rohtak, Haryana, India in 2006-2007. In addition to the exploration, we conducted the trial excavation at three sites: Farmana, Girawad and Mitathal. We have already published the following report from RIHN:

Vasant Shinde, Toshiki Osada, M.M. Sharma, Akinori Uesugi, Takao Uno, Hideaki Maemoku, Prabodh Shirvalkar, Shweta Sinha Deshpande, Amol Kulkarni, Amrita Sarkar, Anjana Reddy, Vinay Rao and Vivek Dangi (2008) Exploration in the Ghaggar Basin and excavations at Girawad, Farmana (Rohtak District) and Mitathal (Bhiwani District), Haryana, India. *Occasional Paper 3*: 77-158. (Reprinted in Toshiki Osada and Akinori Uesugi (eds.) (2010) *Current Studies on the Indus civilization*. Delhi: Manohar. pp. 77-158.)

Professor Shinde contributed reports on the structural remains recovered from sites (Chapter 3) as well as an introductory chapters (Chapters 1 and 2). Chapter 4 on pottery and Chapter 5 on minor artefacts were written by Akinori Uesugi from our institute. Chapter 6 deals with the AMS radiocarbon dates that was prepared by the Paleo-Labo AMS dating groups. I thank these contibutors for their work.

Last but not least, Dr. Uesugi has been done a lot to publish such a fine quality. I thank his painstaking efforts.

CHAPTER 1

INTRODUCTION

by Vasant Shinde

As a part of the Indus Project of the Research Institute of Humanity and Nature, Japan, the project entitled Climate and Culture: An Interdisciplinary Approach to the Harappan Archaeology in the Ghaggar Basin was initiated in 2006. As a part of the study of the Harappan Culture, extensive and intensive archaeological survey was initiated to discover new sites and study already known sites in the Ghaggar Basin and some potential locations were selected for the collection of samples for climate reconstruction. Three sites were initially selected for small-scale excavation, namely Girawad, Farmana (Rohtak District) and Mitathal (Bhiwani District) in the state of Haryana. This was the work of a reconnaissance nature to identify promising site for further large-scale work. The site of Farmana, an extensive site that has both Early Harappan and Mature Harappan deposits, was found suitable for large-scale work. The site of Girawad was badly damaged when we visited it in the early 2007. The owner of the land in which the site lies, was in a process of removing the entire habitation deposit present at the site as he was keen to reach to the natural level which is conducive for agriculture. The site had a potential only for rescue excavation work, which we did for one season in 2006-07. However, it is heartening to note that the evidence we could rescue from the site is very significant and has indeed contributed considerably to the understanding of the Regional Early Harappan Culture that flourished in the Ghaggar Basin.

The aim and objective of our work at the site of Girawad was to establish the characteristic features of the Early Harappan culture in the Ghaggar Basin and place it in proper chronological order. The spatial and temporal extent of this culture needed to be established, especially in relation to the Harappan Civilization. Additionally, the characteristic features of the Early Harappan Regional Hakra Culture Tradition are yet to be properly understood, as no systematic work on this culture has been carried out. The site of Girawad is only the second to produce a discreet deposit belonging to the Regional Hakra Cultural Tradition, the first being Bhiranna, located 60 km to the northwest in the Fatehabad District. Girawad, excavated on a large scale, contributed a substantial body of new data, providing an opportunity to investigate structures, storage and cooking facilities, ceramic traditions, and other attributes of the material culture of these Early Harappan cultures.

The Indus Team is grateful to the Archaeological Survey of India and the Haryana State Department of Archaeology for permission to carry out research at the site of Girawad. We are also grateful to the authorities of Deccan College, Post-Graduate and Research Institute, Pune, India, Research Institute for Humanity and Nature, Kyoto, Japan and M.D. University, Rohtak, India for their support and encouragement. The authors also sincerely thank the following individuals helping us in many ways. The large-scale excavation work was carried out successfully only due to the active participation of a number of individuals including Akinori Uesugi, Amol, Jyotiram, Prabodh, Anjana, Neha, Gauri, Amrita, Shweta, Sharada, Vivek, Soumi, Kanchani,

Vishwasrao, T. Uno and K. Malap. We also thankfully acknowledge the support of the local people in the excavation operation and Mr. Amit for providing transportation during the course of the excavation. Last but not least, we would like to thank profusely Mr. Adam Green from New York University, USA for painstakingly editing and critically evaluating this manuscript.

CHAPTER 2

THE SITE AND ECOLOGICAL BACKGROUND OF THE GHAGGAR BASIN

by Vasant Shinde

1 INTRODUCTION

The site of Girawad (28°58'41" N and 76°28'47" E), one of the important Early Harappan sites in Haryana (Figures 2.1 - 2.2) was selected for excavation mainly to salvage the remains, which otherwise would have been lost forever. The ancient site known as 'kheri', lies roughly 3 km to the east of the present village Girawad, falling in the jurisdiction of the Meham Block of the Rohtak District, Haryana. The village is roughly 22 km northeast of the Meham town and lies to about the same distance to the southwest of Rohtak. The ancient site, circular in plan, is an extensive single culture site spread over an area of roughly 8 hectares. This site was discovered by Vivek Dangi (2006), who has reported the presence of the Hakra, Early Harappan, Mature Harappan and Late Harappan remains from the site. However, the surviving evidence rescued from excavations are only of the Hakra Culture. A metal road between Girawad and Samar Gopalpur runs through the site. In fact, the site had been previously dug to build this road of 1 m in thickness. The site is under the ownership of four different farmers and each one has tried to remove habitation soil and to bring it under cultivation. In this process, the entire habitation deposit has been scraped (Figures 2.4 - 2.5).

The major portion of the site lies to the northern side of the metal road. When we had visited the site in early March 2007 a number of features, including a part of the mud platform, pits, large burnt patches, brick attribution and even complete plans of a few furnaces/ kilns were visible at the base of the site. The features visible on the base surface of the site are mostly confined to the southern side of the metal road. It was this area which was selected for a rescue excavation. A datum point was fixed with the help of GPS on the heap of soil and debris, which is roughly 35 meters towards the southern side of the metal road. From the datum point 41 trenches measuring 5 m by 5 m were laid. All the trenches were located on the northern side of the datum point (Figures 2.3 - 2.6). These trenches have been given simple numerical numbers starting from 1. Trenches no.1 to 5, situated near the datum point, were not excavated, simply because the features were not visible on the surface. Trenches nos.6, 7 and 8 were located on the eastern margin of the area. They are numbered from south to north. Trenches nos.11, 12, 13, 16, 17, 18, 19, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40 and 41 were all located to the western side of the first line consisting of Trench nos.6 to 9. Some of the trenches in a series, in which no features were visible, were not excavated.

The first settlers at the site built a very strong mud platform, in which different features were made. The mud platform was visible over an area of 50 m from east to west by 30 m from north to south. All the features that have been excavated belong to the earliest occupation of the site. The ceramic assemblage found here appears to be slightly different from that of Kunal and can be dated to around the middle of the Fourth Millennium BC. The pottery from this site indicates its early stage of development as it is

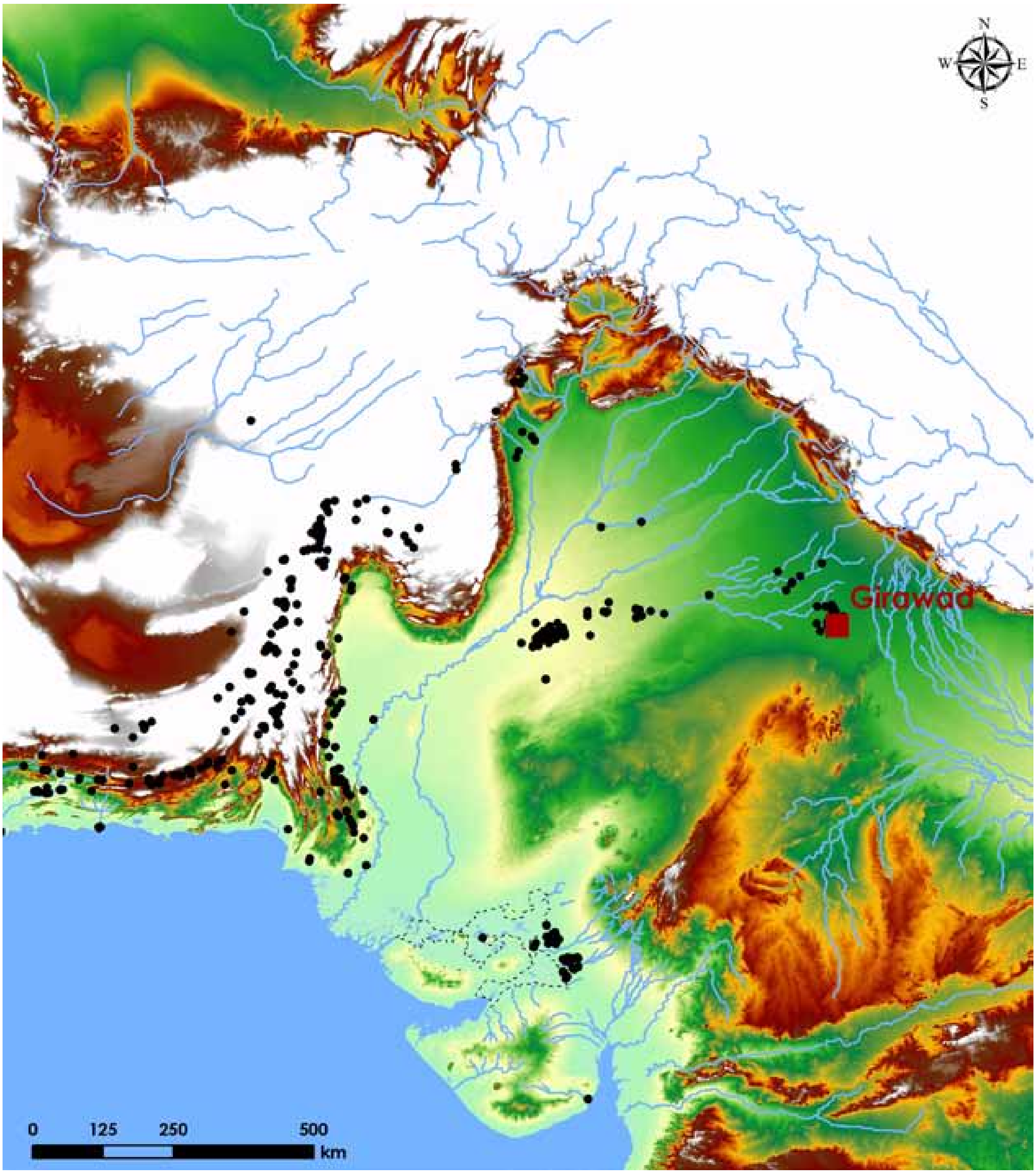


Figure 2.1 Location of Girawad (Black dots represent the pre-Harappan sites)

partly wheel-made and party hand-made unlike the Kunal pottery, which is fast wheel-made. Though the pottery from Girawad is similar to those reported as the Hakra Ware Culture by M.R. Mughal (1997), the regional variation can be observed in the surface treatment, decorations and shapes. Although some of the features of the pottery are similar to those found at Siswal, they also contains a lot of variations. This is the Early Harappan phase at Girawad, which is the Regional Hakra Culture Tradition in the Ghaggar Basin.

2 ECOLOGICAL BACKGROUND

The Ghaggar River Basin lies mostly in the states of Haryana and Rajasthan. The Ghaggar Basin includes subtropical, semi-arid to sub-

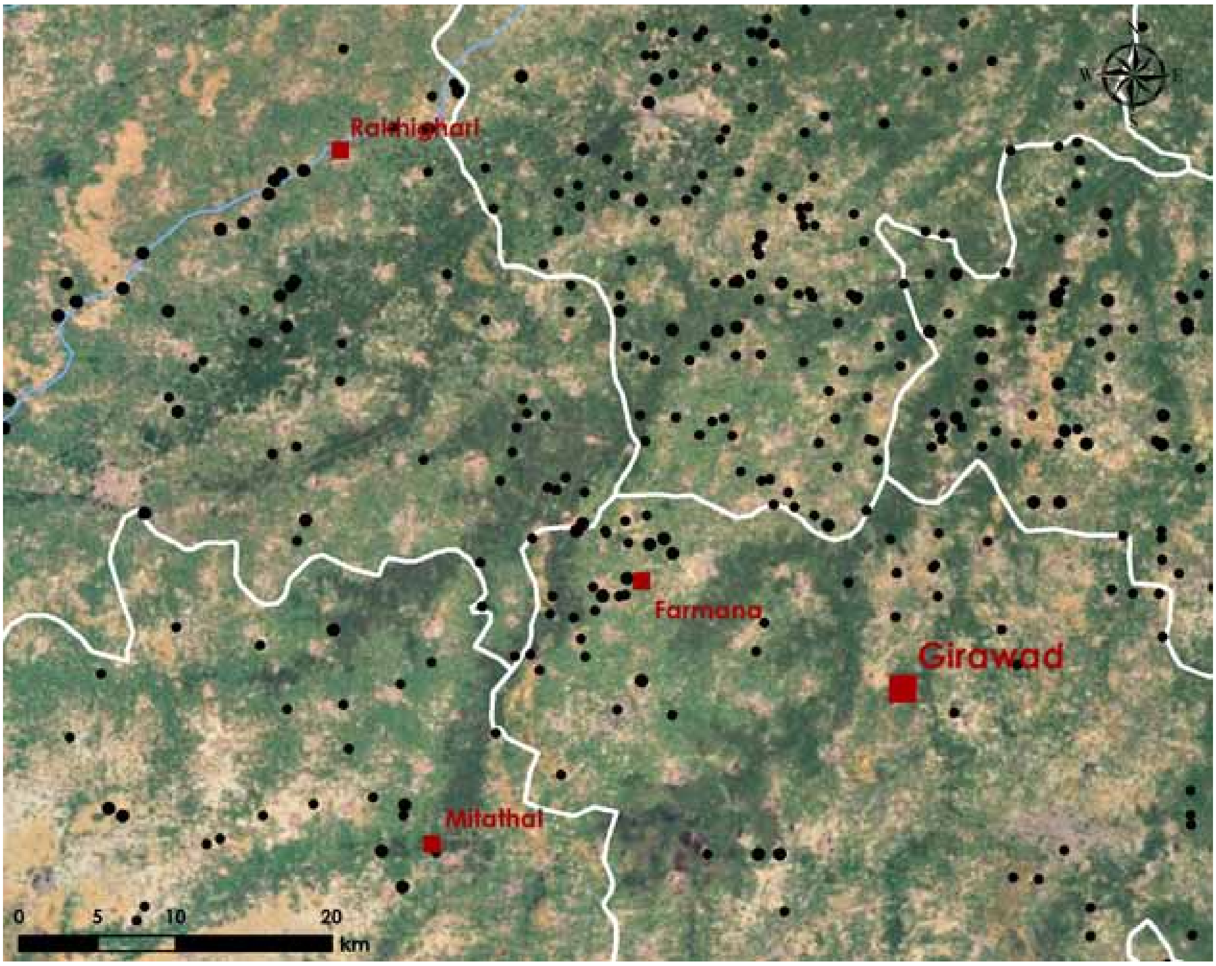


Figure 2.2 Location of Girawad (Black dots represent the Harappan sites in general)

humid, continental and monsoonal climate zones. Throughout much of its extent it experiences a prolonged hot period from March to October and fairly cool winters from November to March. The period from July to about mid-September is the southwest monsoon season. The natural vegetation found in the Ghaggar Basin includes tropical thorn forests, consisting of plants like Kikar, Jall, and beri. Common shrubs are Bans, Vanvar, Babhool, Mallah, Arir, Phoa, Khip and Ak. Some medicinal herbs like Bansa, Kharuti, Bhakhra and Dhattura are also found. The most important natural vegetation of the area are the grasses, such as Dhaman, used mainly as fodder. 'Chimber' or Khorimber, Kheri or Kur, Duchab, Duband Sarkanda are also fodder grasses that grow naturally on fallow lands.

The geology of Haryana is largely Precambrian. It is characterized by a number of distinct but interrelated formation systems, including the Aravallis, Siwaliks, and the alluvial plains. The Aravalli Hills are the oldest geological formation present, bordering the Chautang Basin to the south and west in Bhiwani, Mahendragarh and Gurgaon Districts. They are composed of quartzite, quartzitic sandstone, mica schist and crystalline limestone. The Siwalik system located to the northeast of the Chautang Basin is composed primarily of sedimentary rocks. The Chautang Plain developed through the deposition of alluvial sediments, including sand, silt and occasionally gravel beds. The alluvium completely covers the rock geology of the floor. The whole expanse of the alluvial plain is crossed by relict channel beds from the Chautang and Ghaggar Rivers, which occasionally shifted their beds in Holocene times leaving interlocked alluvial plains along its receding course. These relict beds are now covered by

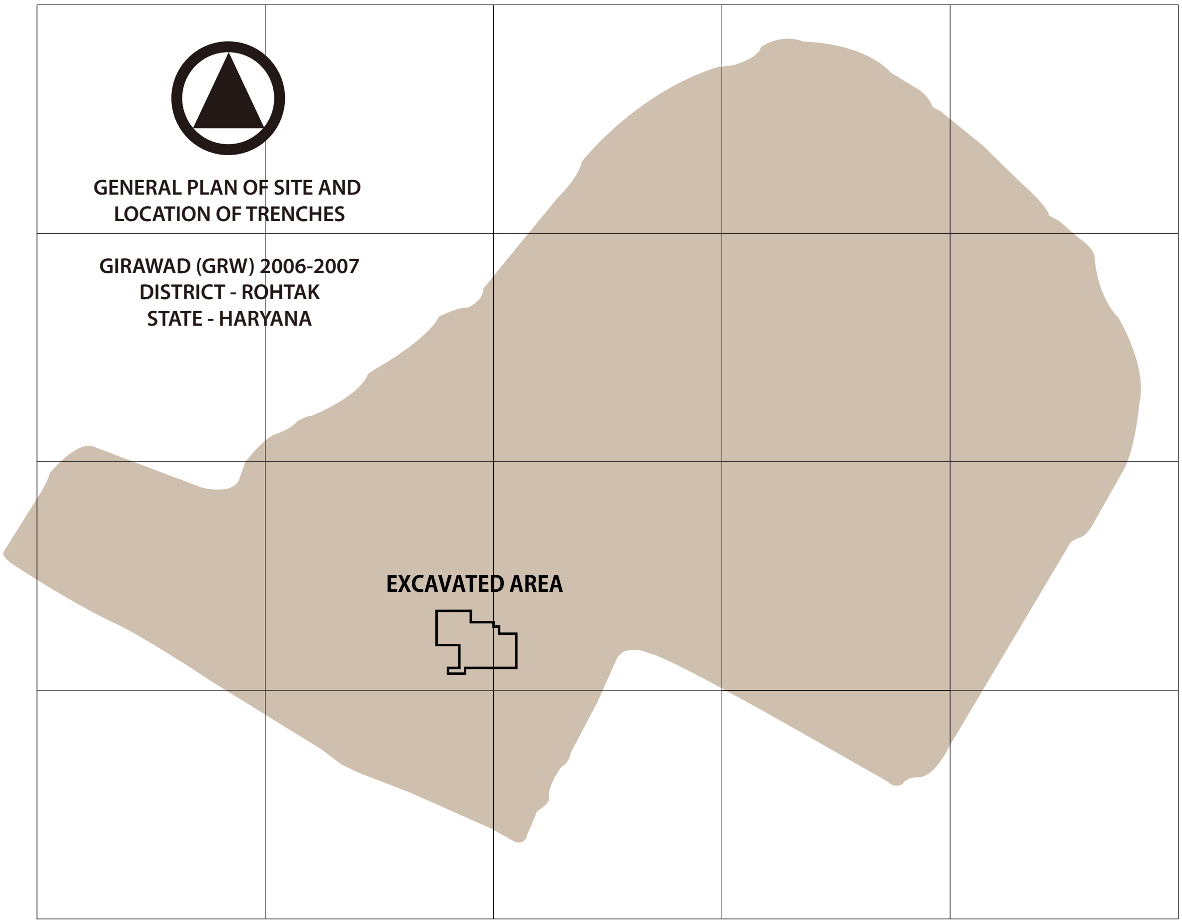


Figure 2.3 General plan of the site

aeolian deposits from the recent past. The thickness of the alluvium varies from 100 m to more than 400 m at places. The sediments are heterogeneous in character and are deposited on a basement of metamorphic and igneous rock of the pre-Cambrian age.

The soils of this area have been formed by Aeolian and fluvial processes. The main physiographic units comprising the soils in this area are Chautang Flood plains and Aeolian plains. The relict courses of the Chautang River filled with sediments over time, causing it to shift its physiographic position many times. Topographically, the Chautang Basin is a flat, monotonous upland plain; the western portion of which marks a gradual transition to the Thar Desert.

The importance of agriculture to the economy of the region is apparent by the fact that more than 70 % of the people reside in the villages and almost 81.3 % of the total area is actually sown. There are two main crop seasons: the kharif (June - August to September - October) and rabi (October - November to April - May). The major kharif crops are bajara, maize, jowar, cotton, rice and sugarcane. Among the rabi crops wheat, gram, barley and mustard are notable. Wheat is the dominant crop in the region, comprising 36.3% of the total area under good grain cultivation. Next to wheat, gram occupies 16 % of the gross cultivated area. Other cereals such as barley are grown in the drier parts, and rice is produced in the wetter and waterlogged areas. The next most important cereal is bajara, which is grown in the dry and sandy parts of southern Haryana. Jowar and maize, which are both cereal and fodder crops, are grown in the drier and wetter parts respectively. Jowar is found throughout the Haryana state excepting the district of Hissar. Cotton and sugarcane, both cash crops, have recently gained importance in the region.

1Deforestation has almost driven the indigenous



Figure 2.4 General view of the site before excavation



Figure 2.5 General view of the features before excavation

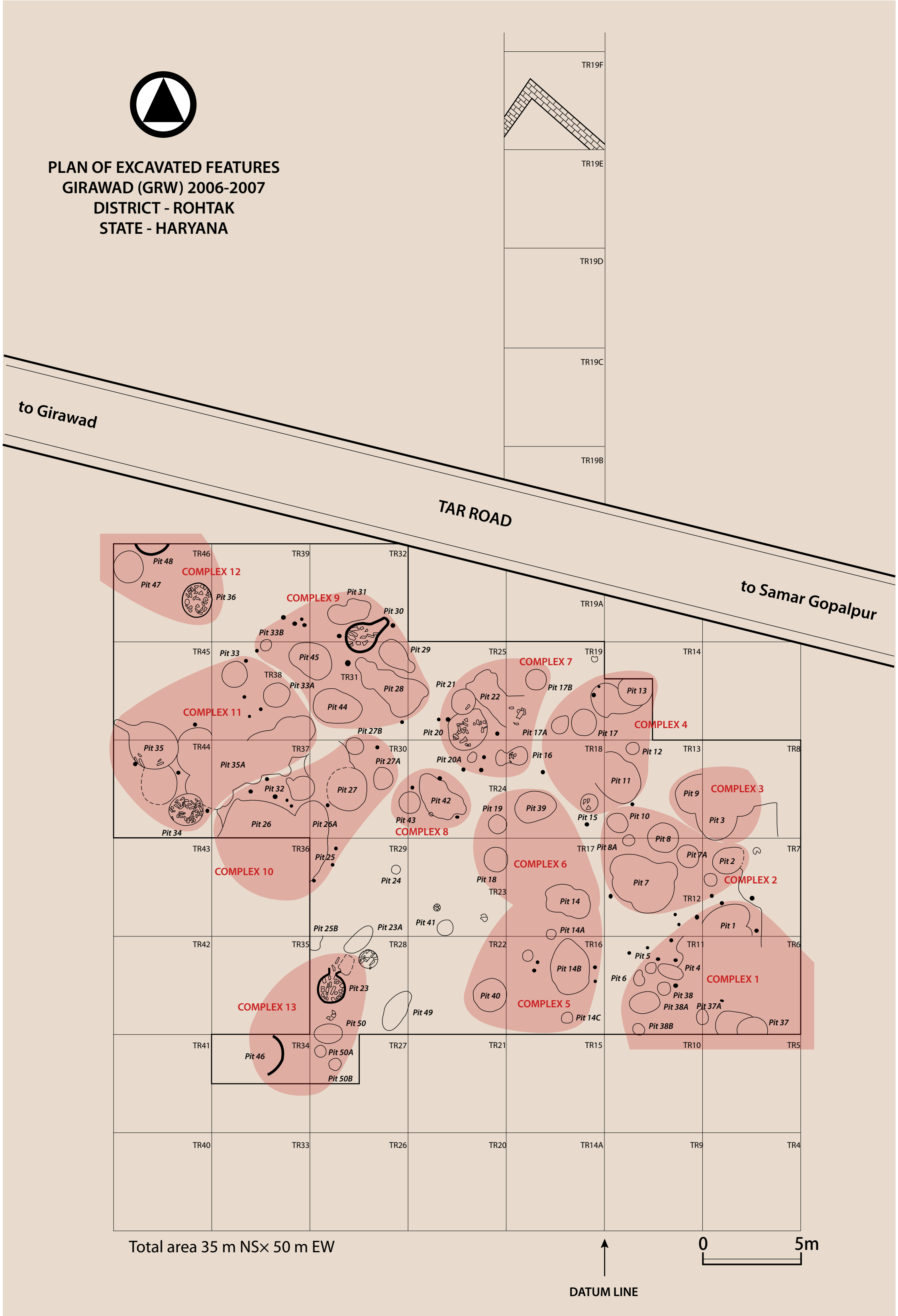


Figure 2.6 Plan of excavated features

fauna and flora to extinction. Animals that once roamed this area in the recent past include the common langur, tiger, leopard, panther, cat, the small Indian civet, the common mongoose, jackal, Indian fox, and others. Striped palm squirrel or gilehary, sahi or the Indian porcupine, the Indian Gerbille, the common house mouse and rat are the most common small mammals found in Haryana. Chinkara or ravine deer, blackbuck and the blue-bull (nilgai) are also found. A large number of game birds, some of them residential, are found throughout the year, along with some winter migratory birds. Various types of ducks and geese are also found, including the eastern grey leg goose, bareheaded goose, Brahany duck, common shell duck, pintail, common tail, mallard, blue winged teal, shoveller, common pochard, ferruginous duck, tufted duck, comb duck, large whistling teal, tree duck, partridges, quails, Indian black partridge, grey partridges, Indian yellow legged buttonquail and Indian bustard quail are resident species. Sand-grouses, particularly the large pintail sand-grouse, spotted sandgruse, and the Imperial or black-bellied sandgrouse visit in the winter (Sachadev *et al.* 1995: 11).

3 GHAGGAR AND CHAUTANG RIVER BASINS

In the state of Haryana, all the rivers except the Yamuna are semi-perennial. The Ghaggar River system emerges from the lesser Himalayas and piedmonts, passing through the Indian states of Haryana and Rajasthan and then entering the Bahawalpur region of Pakistan. Upon entering Pakistan, the Ghaggar River becomes the Hakra. In the rainy season, the Ghaggar River flows up to Hanumangarh, for a distance of about 465 km from its source. In central and southern Haryana, shifting channels from the Chautang have been identified between the Ghaggar and the Yamuna. The Chautang, a major tributary of the Ghaggar, is also a seasonal stream in its upper course. We believe that the Ghaggar and Chautang Rivers were both important during the Early and Mature Harappan periods based on the large number of sites that have been surveyed.

The Ghaggar-Hakra River has been identified as the ancient Saraswati and the Chautang as the Drishadvati, which were often referred to in the Rg Vedic period. The earliest enquiry into this problem was made by Surgeon-Major C.F. Oldham. He extensively reviewed information on the course of ancient rivers, drawing not only on the geographic literature but also reconstructing a chronology of river flow on the basis of ancient literature, including the Vedas, Puranas, Mahakavyas, and Medieval chronicles. Oldham's most important insight was the connection between the Sotra or Hakra rivers and the dried bed of the Ghaggar. "The waters of all those streams combined could never, under any imaginable conditions, have maintained a permanent river of such magnitude as Hakra, for a distance of a more than five hundred miles beyond the furthest point to which they reach, at the times of their greatest floods" (Oldham 1874: 2).

The Chautang fed the Ghaggar River in the past, probably until around 2000 BC. Like the Ghaggar, the Chautang rises in the Siwaliks, flowing parallel to the now-dry river for some distance along a more southerly course. It turns west, passing Hissar and the archaeological sites of Siswal, Sothi, Nohar and Rakhigarhi. It the joins the Ghaggar at Suratgarh, near the sites of Kalibangan and Rang Mahal, which seem to have exerted some influence over this strategic junction.

Several archaeologists and geographers have strongly argued in favor of the identification of the Chautang river as the ancient Drishadvati mentioned in the Rgveda. The Ghaggar and Chautang, originating in the Sirmur area, used to flow through Jind, Hansi, Hissar and then after joining the Ghaggar at Hanumangarh and Cholistan desert, Pakistan, flowed south. Their courses are independent of the Indus River system. One or all of a number of

factors led to the eventual drying of the rivers. These include uplift in the Siwaliks, tectonic activity in the Himalayas, increasing aridity in Rajathan, and increasing levels of deposited sediment in their channels. The relict beds are now more or less low plains. At present the Chautang is completely dry and the Ghaggar flows only seasonally in north Haryana. R.D. Oldham (1886: 339) has discussed the connection between the eastern Nara and the Indus in great detail and has pointed out that the Yamuna also contributed to the flow of the Ghaggar. He also argues that there was a bifurcation in the course of the Yamuna or Saraswati in the Vedic period, producing two minor drainage channels – the Sarsuti and the Chitang (Chautang). (Oldham 1886: 343).

Wilhelmy (1969) was the first scholar who proposed that water flow shifted from the Chautang to the Yamuna. D.N. Wadia has argued that the Yamuna flowed through Punjab in the Vedic era under the name of the Saraswati. "In the course of time it took a more easterly course and merged into Ganges at Prayag. It then received the name Jamuna" (Wadia 1966). H.T. Lambrick (1964) states that the Yamuna was at one time a contributor, by way of the ancient bed of the mile-wide Chitang, but eventually slipped off the ridge to the East. However, the Indus Project has determined that the Chautang and Yamuna always flowed parallel and there is no possibility that they ever merged.

On the basis of aerial photographs and LANDSAT imagery, Bimal Ghose *et al.* (1979: 446-51) that there was a wide Saraswati valley running from Suratgarh through Anupgarh to Fort Abbas and Ahamadpur. Further from Anupgarh, another wide belt, ran southward in discontinuous patches up to Sakhi, then through a dark strip of vegetation through Khangarh, Islamgarh, Dharmi Khu, Ghantel, Shahgarh, Bubuwali and Rajar. This was the course of the Saraswati from the Himalayas to the Rann of Kutch after the rivers entered relation to the Luni. Afterward the river gradually shifted westward and occupied the courses of the Wahinda and the Raini. The river then shifted westward to meet Sutlej near Ahemadpur East. The probable cause of these shifts is advancing sand and aridity. The authors also assert that tectonic activity may have contributed.

Yash Pal *et al.* (1984: 496) used remote sensing data to identify a peculiar feature of the old beds of the Ghaggar, It tends to flow along straight lines that join together at sharp angles. This reflects structural control as the old Ghaggar seems to have flowed into an unstable channel controlled by the lineaments, probably enechelon faults. A little tectonic movement was sufficient to disturb its previous course and forced it into the present channel. Similar evidence has been noticed in the case of the Sutlej, as the river has followed a multitude of small channels before it found its present course. The authors proposed that the Sutlej was the main tributary of the Ghaggar in the past. Tectonic uplift probably contributed to the capture of the Sutlej by the Beas. Headward erosion and an extensive fault, into which the river was diverted, probably facilitated the shift of the Sutlej into the Indus system. The authors point to the sharp westward right angle bend in the course of Sutlej west of Ropar as evidence of the river's capture. Like several of the previously discussed authors, Yash Pal *et al.* (1984) believe that the Yamuna may have contributed to the Ghaggar River. A map based on satellite imagery shows that the Yamuna changed its course at least three times before it occupied its present course.

By incorporating archaeological evidence, the authors have reconstructed the chronology of the geo-cultural events in the Ghaggar Basin. The Ghaggar was a dynamic river during the Early Harappan and the Harappan times (3200 BCE - 2600 BCE and 2600 BCE - 2000 BCE respectively). The Chautang persisted into Late Harappan times (Yash Pal *et al.*1984: 496). In 2007, the present authors conducted an archaeological survey of the Hanumangarh and Ganganagar Districts of Rajasthan and the Bhiwani and Rohtak Districts of Haryana, recording the locations of sites using GPS. Surprisingly, all the sites near Anupgarh area are actually located in the

Ghaggar River course. This suggests that the Ghaggar (Saraswati) River had dried up long before the emergence of the pre-Harappan culture in this area. The true picture will emerge only when all of the sites in the Ghaggar Basin are visited and recorded using the GPS. Baladev Sahai suggests that tectonic movements have played a primary role in bringing about changes in river systems in northwestern Indian subcontinent.

Climatic factors must have exacerbated the problems caused by changes in the Ghaggar and Chautang rivers, but their effects are unlikely to have played a major role (Sahai 1999: 128). Thussu believes that changes in the direction of rivers could be result of combination of east-west and north-south forces related to the northward drift of the Indian peninsula. According to him, Somb and Boli – the tributaries of the present day Yamuna, were the main streams contributing to the Sarasvati. The Yamuna flowed through the Rakshi Nala/Chautang River (Thussu 1999: 205-217). Malik and others have highlighted the evolution of the delta complex of the Sarasvati and other extinct rivers in northwest India and the role of tectonic movements and aridity. In their recent investigations in the Rann of Kachtchh, they proposed that the formation of the delta complex system was a result of contribution of three rivers - Proto Shatadtru (Hakra), Saraswati and Drishadvati Rivers. They also recorded evidence of a fragmentary delta near the western flank of the Nagar Parker Hill joining the relict channel of the Sukri, a branch of the Luni River. They identified this channel as the ancient Drishadvati. A sequence of neo-tectonics around 3500 to 3000 years ago caused a significant decrease in the flow of water in the Sarasvati and the Drishadvati, while the Shatadru was diverted towards Indus (Malik *et al.* 1999: 163-174).

S.P. Gupta has reviewed the available geological data and substantiated it with historical and archaeological literature (Gupta 2001: 30-5) and has strongly argued that the Sarasvati was a glacier fed river. R.S. Bisht (2002) states "the observations made and the theories propounded or conclusions drawn should remain subject to archaeological corroboration, because the palaeo-channels recorded in the imagery could belong to any point of time in the lifetime of the river system." Valdia (2002) supported the idea that continental drift caused tectonic upheavals and in turn hydrological changes in the northwest India. He states "the Saraswati River flowed through a wide channel, now known as the Ghaggar in the southwestern Haryana and adjoining northern Rajasthan. Its major tributary the Drishadvati, now known as the Chautang, drained the eastern uplands of Haryana. It was the floodplain of the Saraswati in which the Harappan settlements were located. More interdisciplinary work is required to understand the courses of the Ghaggar and the Chautang and their relation with the Harappan culture. It is also necessary to determine the chronological phases in which both rivers were active before their relationship with Early and Mature Harappan culture can really be understood. More interdisciplinary work involving archaeologists, geologists, and paleo-climatologists will be necessary to address this problem.

References

Allchin, B. and R. Allchin (1982) The Rise of Civilisation in India and Pakistan. Cambridge University Press, Cambridge, 1999.

Dangi, M. (2006) *Settlement Pattern of Meham Block (Rohtak)*. Unpublished MPhil Dissertation. Kurukshetra University, Kurukshetra,

deMenocal, P.B. (2001) Cultural responses to climate change during the Late Holocene. *Science* 292: 667-673.

Enzel, Y. et al. (1999) High-resolution Holocene environmental changes in the Thar desert, northwestern India. *Science* 284: 125-128.

Kar, A. and B. Ghosh (1984) The Drisdavati river system of India: an assessment of new findings. *Geographical Journal* 150: 221-229.

Kochar, R. (2000) Vedic People: *Their History and Geography*. Orient Longman, Hyderabad.

Mughal, M.R. (1997) *Ancinet Cholistan: Archaeology and Architecture*. Ferozsons, Lahore.

Puri, V.M.K. (2001) Origin and course of Vedic Saraswati river in Himalaya – Its secular desiccation episodes as deciphered from palaeo-glaciation and geomorphological signatures. *Proceedings of the Symppsium on Snow, Ice and Glaciers, Geological Survey of India Special Publication*, vol.53: 175-191.

Radhakrishna, B.P. (1999) Vedic Sarasvati: Evolutionary History of a Lost River of Northwestern India. edited by B.P. Radhakrishna and S.S. Merh). *Memoirs of the Geological Survey of India* 42: 5-13.

Oldham, C. F. (1893) The Saraswati and the lost river of the Indian desert. *Journal of the Royal Asiatic Society* 34: 49-76.

von Rad, U., Schaaf, M., Michels, K. H., Schulz, H., Berger, W. H. and Sirocko, F., A 5000 yr record of climate change in varved sediments from the oxygen minimum zone off Pakistan, northeastern Arabian sea. *Quaternary Research* 51: 39-53.

Rohtash Kumar, N. Suresh, J. Satish, Sangode (2007) Differential features of alluvial fans in the Pinjaur-Soan Dun, NW Himalaya, India:controlling factors. *Himalayan Geology* 28(1): 37-46.

Sharma, J.R., A.K. Gupta and B.K. Bhadra (2005-06) Course of Vedic River Saraswati as deciphered from latest satellite data. *Purātattva* 36:187-195.

Shinde, V., T. Osada, M.M. Sharma, A. Uesugi, T. Uno, H. Maemoku, P. Shirvalkar, S.S. Deshpande, A. Kulkarni, A. Sarkar, A. Reddy, V. Rao and V. Dangi (2008) "Exploration in the Ghaggar Basin and excavations at Girawad, Farmana (Rohtak District) and Mitathal (Bhiwani District), Haryana, India", in T. Osada and A. Uesugi (eds.) *Occasional Paper 3: Linguistics, Archaeology and the Human Past*. Indus Project, Research Institute for Humanity and Nature, Kyoto. pp.77-158.

Singh, G., Wasson, R. J. and Agarwal, D.P. (1990) Vegetational andseasonal climatic changes since the last full glacial in the Thar desert, northwestern India. *Revue of Palaeobotany and Palynology* 64: 351– 358.

Valdiya, K.S. (2001) *Saraswati: The River that Disappeared*. University Press, Hyderabad

Valdiya K.S. (2002) *SARASWATI- The River that disappeared*, First edition. ISRO, Universities Press. pp. 6-77.

Wilhelmy, H.Z. (1969) Das Urstrorntal am Orsrand der Indusbene und das Sarasvati-problem'. *Geomorphology* N.F. Supplement 8: 76–93.

Yashpal, B. Sahai, R.K. Sood and D.P. Agrawal (1980) Remote sensing of the lost Sarasvati river. *Proceedings of the Indian Academy of Science* 89: 317-332.

CHAPTER 3

STRUCTURAL REMAINS AT GIRAWAD

BY VASANT SHINDE

1 INTRODUCTION

Architectural data from Bhirrana, Girawad and Farmana, all of which are located in the Ghaggar Basin, suggests that the people from the Regional Hakra culture lived in shallow pit-dwellings. Excavations at Bhiranna (Rao *et al*. 2004) and Girawad (Shinde *et al*. 2008a) have produced evidence of extensive pit-dwelling complexes (Figures 3.1 - 3.2). Each of these complexes consisted of features like storage pits, garbage pits, water pits and storage pots. Each complex also possessed an open space that appears to have been used for domestic activities. Similar albeit informal complexes are built by migrant labourers in parts of central India today. The Girawad excavations produced evidence of pit-dwellings and mud-brick structures on the same occupation level. This major find suggests that the occupants of Girawad used pit-dwellings and mud-brick structures simultaneously. Additionally, Girawad produced evidence that the Regional Hakra Culture was a class-structured society. Pit-dwelling complexes were probably occupied by craftsmen, mainly potters, as indicated by the discovery of three nearby pottery



Figure 3.1 General view of excavated features, from west

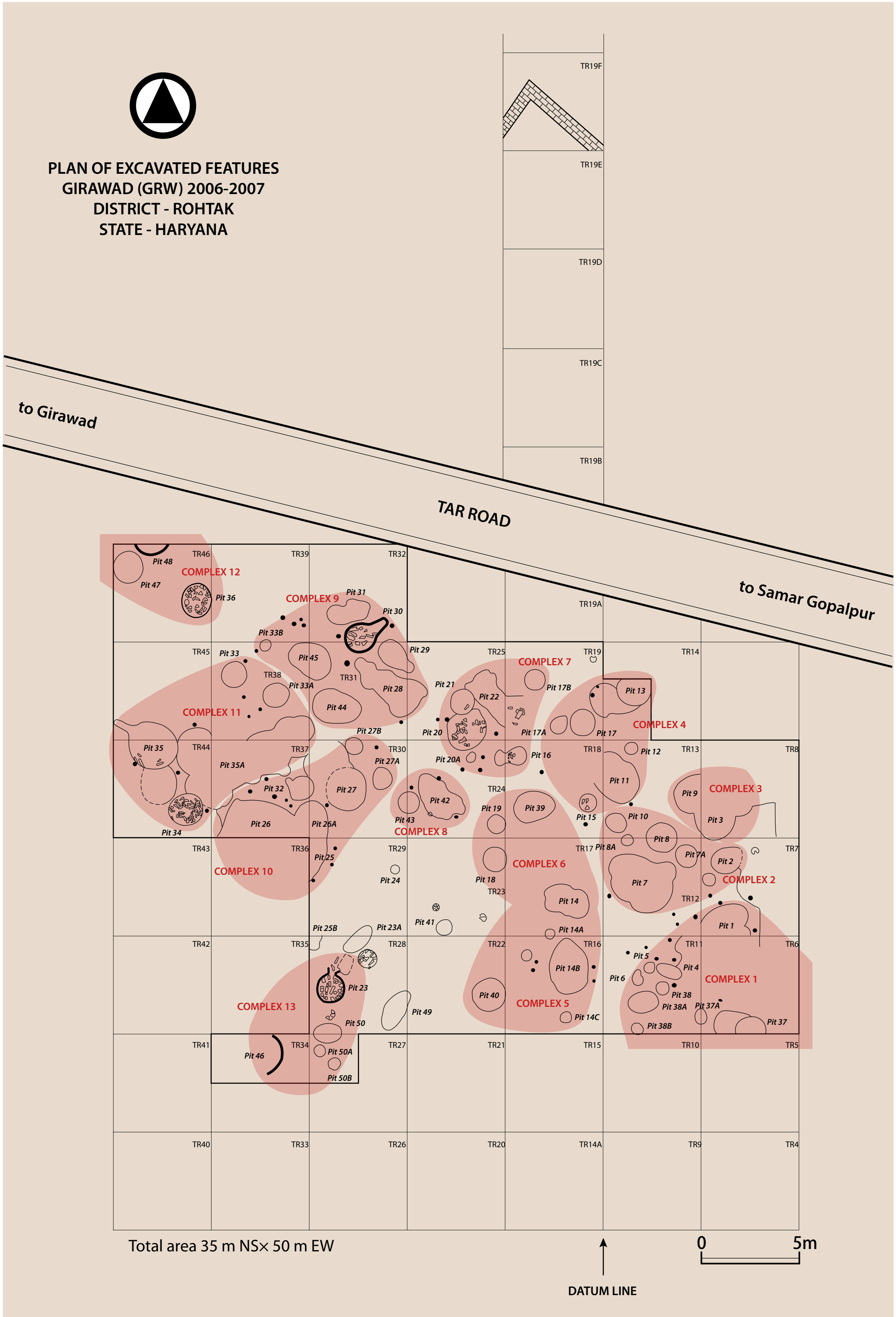


Figure 3.2 Plan of excavated features

kilns (ibid).

At Girawad, the outline of the features became visible immediately after scraping the surface of the area selected for excavation. The features which have been excavated in the designated area include circular or irregular oblong shallow pit-dwellings with occasional post-holes on their peripheries, garbage and storage pits, small circular shallow depressions possibly for accommodating large jars, post-holes, full pots and storage jars survived in their bases and fire places (kilns). The functional analysis of these features is based on their nature and content. It was observed that the pit-dwellings excavated formed different complexes and each complex consisted of features like dwelling pits, storage and garbage pits, sometimes storage jars and even shallow pits identified as bases of large round-based pots. In all 60 different features were excavated and they were found to be belonging to 13 different pit-dwelling complexes identified in the excavated area. The following are the different complexes.

2 STRUCTURAL REMAINS

Pit-dwelling complex no.1 (Figure 3.3)
(Feature nos.1, 4, 5, 6, 37, 37A, 38, 38A and 38B)
(orientation -10° slightly northeast, south west)

This is roughly a plano-convex shallow (10 cm deep) pit dwelling located in Trenches 6, 7, 11 and 12. The major portion of the pit lies in trench 6. It is oriented in NE-SW direction with its convex side towards the NE. The eastern and northern sides of the pit are straight in line measuring 2.20 m in length whereas the southern line is 3.75m long. Towards its northwest end, there is a circle (1.50 m in diameter), made of clay which could be identified as a base of the storage bin. It has an opening towards eastern side which is 1.40 m wide. This could be the entrance of the pit dwelling. The portion of the entrance and also outside the entrance is smoothened and well-made. It is an indication of its constant and intense use. On the edge of the pit are noticed a number of postholes (6) located along the margin of the eastern line. It is located 80 cm towards the northern side from the corner of the pit. It is circular with a diameter of 10 cm and depth of 10 cm. There are two postholes along the southern margin, one located near the south eastern corner at a distance 80 cm from the corner towards the west. It is slightly oval measuring 15 cm (N-S) and 13 cm (E-W), and 13 cm deep. The other one is located exactly at the south western corner. The distance between the two postholes along this line is 2.70m. It is circular with a diameter of 20cm. Three postholes are located along the eastern curve of the pit. One is 50 cm to the north of the south eastern corner circular in shape (17 cm in diameter) and a depth of 10cm. The other one is in the middle, 2.40 m to the north of the first one. It is circular with a diameter of 15 cm and a depth of 10cm. The third one is located slightly towards the northeastern side of the 2nd one, at a distance of 1.40 m. It is circular with a diameter of 15 cm and a depth of 10cm. One small circular (12m diameter posthole is located at the tip of the arch of the pit towards the north eastern side. It is 10 cm deep. One of the post holes is located near the entrance, 70 cm to the north. It is perfectly circular with a diameter of 15 cm and 17 cm in depth. Inside the pit dwelling is a well made and smooth hard floor which appears to have been also plastered. The edger of the pit dwelling has become slightly irregular due to the disturbance as it is close to the exposed surface.

The pit dwelling is located (the south eastern corner) 1.45 m to the north of the southern trench line and 1.90 m (the projected part of the entrance) to the west of the eastern section.

1A no. of small pits are associated with this complex. They are as follows:

PIT No. 37 (Tr.no.6) (orientation E-W)

This is located along the southern trench line of No.6 at a distance of 1.65 m to the west of the south eastern peg. It is an oval pit oriented along the E-W

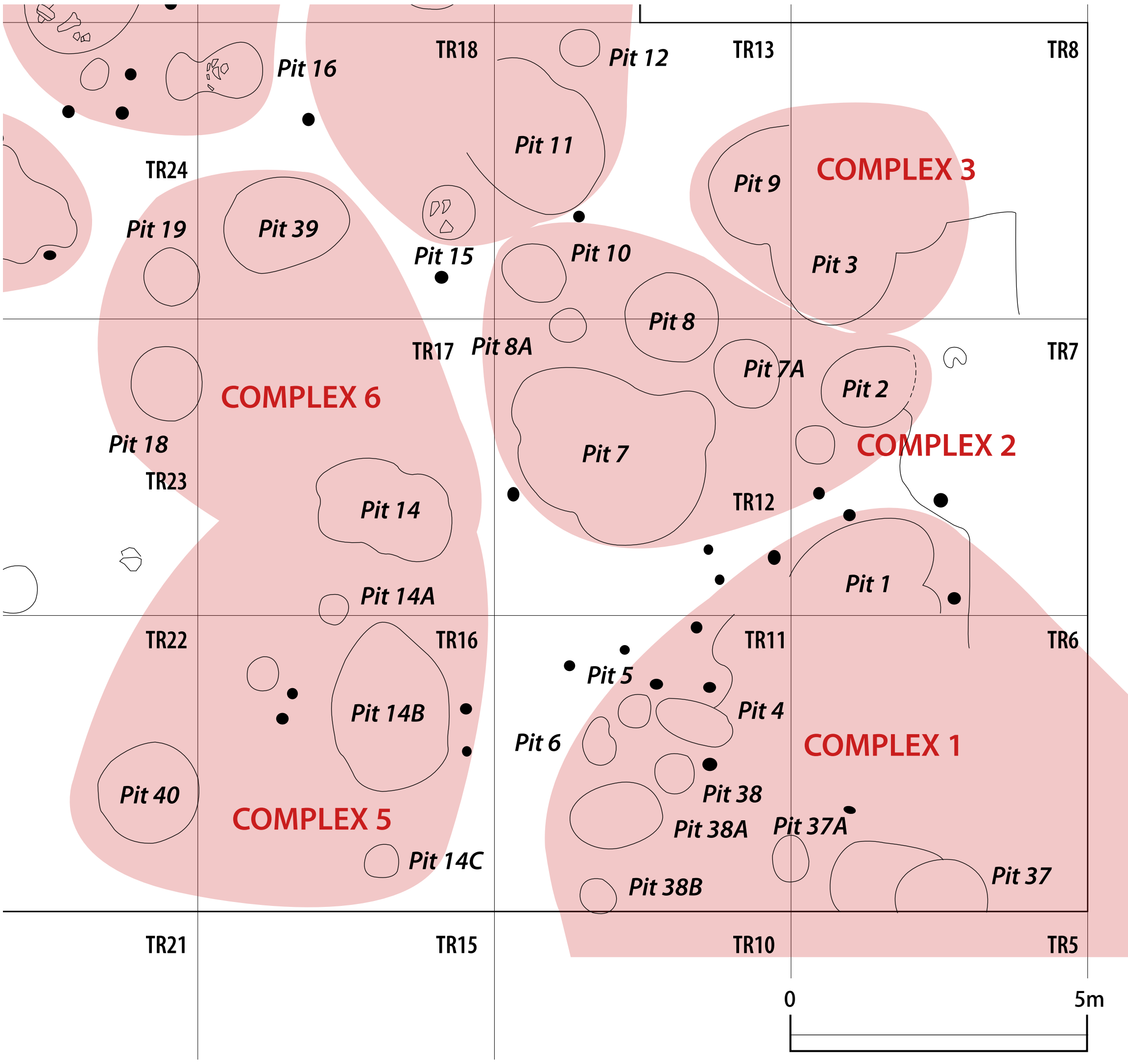


Figure 3.3 Pit-dwelling complex nos.1, 2,3, 5 and 6

direction measuring 2.50 m. It is slightly broad (1.30m) towards the western side and narrow (75 cm) near the eastern end. The base of the pit, which is at the depth of 60cm, is uneven. The irregular shape of the pit and the uneven base suggests it could be a garbage pit of the pit dwelling complex no.1. The pit contains charred bones and pottery fragments. The garbage pit is located near the south eastern corner of the main dwelling.

PIT No. 37A (In Tr. nos. 6 and 11) (orientation E-W)

Located 60 cm to the west of pit 37 and 60 cm to the south of pit dwelling 1, is a very shallow (7 cm) oval pit measuring 90 cm (N-S) and 60 cm (E-W). It is located along the southern margin of pit dwelling 1. Considering its shallow nature, it could be identified as depression for most probably holding a saddle-quern.

PIT No. 4 (Tr. 11) (orientation 20° northwest, southeast)

Pit no.4 located at the southwestern corner of pit dwelling 1 is an oblong measuring 90 cm E-W by 60 cm N-S, and 35 cm deep. Surface of the base is uneven. This pit is directly connected to the pit dwelling 1 as there is no edge between them. As it is located, near its south-eastern corner and directly attached to the pit dwelling, it is not unlikely that it was meant for collecting the dirty water resulting from the draining of the pit. The very fact that it has got uneven but



Figure 3.4 Feature nos.4, 5, 6, 38 and 38A, Pit-dwelling complex no.1, from south

smooth surface made of hard clay, supports the hypothesis suggested above.

PIT No.5 (Tr. No.11)

It is located towards the western side of pit no.4 at a distance of 15 cm. It is circular on plan (50 cm in diameter) with perfectly vertical sides and flat bottom. The pit is 35 cm deep. The sides and bottom are smoothened and could be identified as one of the storage pits of the complex.

PIT No.6 (Tr. No. 11)

It is located 24 cm to the southwestern direction of pit no.5. It is also perfectly circular on plan with a diameter of 50cm. It has perfectly vertical sides and flat bottom at a depth of 35 cm. The sides and bottom are also plastered and could have been used as another storage bin for the complex.

PIT No.38 (Tr. No.11)

It is located 25 cm to the south of pit No 4. It is also circular on plan with a diameter of 60 cm It is cylindrical with a depth of 35 cm. The base of the pit is slightly staggering and could have been used as the third storage pit of the complex.

PIT No.38A (Tr. No.11) (orientation 10° northeast, southwest)

Located 35 cm to the south of pit no.6 and at the same distance towards the south eastern side of pit 38 is an irregular roughly oblong pit. The pit measures 1.35m (E-W) by 1m (N-S) and towards both the ends it tapers. The depth is 30 cm and contains charred bones and few pottery fragments. The irregular nature of the pit, uneven sides and bottom and the contents lead us to believe, that it was one more garbage pit of the complex no.1.

PIT No.38B (Tr. No.11)

It is a very small circular pit located 68 cm to the south of pit 38A. It is circular on plan with a diameter of 50 cm and depth of 10cm. The bottom slightly uneven may have been in contact with water for a considerable period as it has been hardened and formed into clay lumps. This could be identified as a depression for holding round based water storage pot.

Pit-dwelling complex no. 2 (Figure 3.3)
(Feature nos.7, 7A, 8, 8A and 2)

PIT No.7 (Tr. No.12) (orientation 30° northwest southeast)

This appears to be a shallow pit dwelling as it is considerably large in size and at least two postholes are visible along its margin (Figure 3.5). The pit originally was oblong in shape but due to the disturbances, the sides have become irregular.

Pit No.7 is located in tr. no. 12, 1.20 m to the west of eastern section of the trench and 1.20 m to the north of southern section of the trench. The pit is oriented 30° northwest – southeast. The northwestern part of the pit is semi-circular whereas the southern part of the pit is quite irregular in shape. Along the southeast margin is 2.90 m broad, in the middle it is 2.30 m, whereas the arch of the pit dwelling at its maximum width is 2 m. The length of the pit is 3.72 m. It is a very shallow pit (6 cm) with a rammed floor which is slightly uneven of the two postholes; one is located 60 cm to the southeastern side of margin. It is small circular (11 cm in diameter) in shape with a depth of 5 cm. The other one is located 30 cm outside the southern margin near the arch of the pit. It is perfectly circular, diameter 15 and a depth of 10cm.

PIT No.2A (Tr. Nos.7 and 12)

It is located 1.28 m to the east of pit no.7. It is circular with a diameter of 70 cm and a depth of 15 cm. The sides and the bottom are symmetrical and smooth. This could be a shallow storage pit of the complex.

PIT No.2 (Tr. No.7)

It is located 35 cm towards north western side of 2A. It is circular (diameter 1.20m) and a very shallow 10 cm depth. As it is badly eroded, its exact use cannot be identified.

PIT No.7A (Tr. No. 12)

It is located 15 cm towards northeast corner of pit7. It is slightly oval oriented E-W, 1.20 m (E-N) and 1.05m (N-S). It is 25 cm in deep. The sides and the bottom are smooth and symmetrical. This could be identified as another storage pit of the complex.

PIT No.8 (Tr. Nos.12 and 13)

It is located 45 cm to the north of the pit 7. It is large circular pit with a diameter of 1.50 m It is cylindrical with a flat base. The sides and bottom are smoothened. This could be the third storage pit of the complex.

PIT No.8A (Tr. no 12)

It is 20 cm to the north of the pit no.7 and 50 cm to the southwest of pit no.8. This cylindrical pit has a diameter of 60 cm and a depth of 30 cm. It could be a small storage pit of the complex.

Pit-dwelling complex no.3 (Figure 3.3)
(Feature nos.3 and 9)

These two circular features form one big pit-dwelling in the shape of Arabic numeral '8'. The other features of this complex could not be detected as they most probably lie to the north and northeast area which is unexcavated. They are oriented at 50° from northwest to southeast. The diameter of Feature no.3 is 2 m whereas that of no.9 is 3.05 m. The maximum depth of the pit-dwelling along the western edge of pit Feature no.9 is 20 cm. Feature no.2 associated with Pit-dwelling complex 2 could also be associated with



Figure 3.5 Feature no.7, Pit-dwelling complex no.2, from southwest



Figure 3.6 Feature nos.7A, 8, 8A and 10, from south

this complex as it is located equidistant from both. The other features of this complex which are most probably are located in north and northeast could not be excavated as it was a part of the unexcavated area, owing to the presence of the metal road.

Pit-dwelling complex no.4 (Figure 3.7)
(Feature nos. 11, 15, 12, 13, 17 and 17A)

PIT No.11 (Tr. Nos.13 and 18)

It is located 3.25 m to the west of eastern section of the tri 13 and 1.90 m to the north of southern section the pit is oriented 50° northwest- southeast. The pit is roughly oval and resembles a 'yoni' shape. The length of the pit is 2.90 m. The south eastern part of the pit is roughly circular with a diameter of 2.20 m. The northwestern part is narrow (width 1.40m). The pit is 72 cm deep. The sides are perfectly vertical and flat at the base. Three postholes are visible along the periphery, two near the narrow side (northwest) and one outside the south eastern end. The two postholes which are located on the either side of the narrow end are very small and slightly irregular in shape. The third post hole located at the southeastern end is circular with a diameter of 20 cm and 10 cm in depth.

This pit appears to be deep pit dwelling as it is large in size with vertical sides, flat base all smoothened and two postholes on the periphery.

A number of the features are associated with this pit dwelling too:

PIT No.15 (Tr. No.18)

It is located in Tr. No. 18, 30 cm to the southwest of pit no. 11. It is and oval pit oriented 10 northeast-southeast. It measures 90 cm (N-S) by 80 cm (E-W). It is 25 cm deep. The sides and the bottom are smoothened and plastered and therefore could be identified as a shallow storage pit of the complex.

PIT No.12 (Tr. No.13)

It is located 70 cm to the north of pit no.11 and 95 cm to the west of eastern line of Tr. No. 13. It is a small roughly circular pit, diameter of 40 cm with straight sides and staggering base. It is 25 cm deep in the centre. This could be meant for holding a round base storage jar and could be associated with complex No. 4.

PIT No.13

It is located 1.90 m to the north of the narrow end of pit no.11. The pit which became clear while exposing the section lines partly in the area cleared for section and partly in Tr. No.19. It is a circular pit with a diameter of 1.50 m. The upper part has been completely eroded and only the basal portion is remaining considering the contents consisting of large potsherds and charred bones and irregular in nature, this could be identified as the garbage pit of the complex.

PIT No.17 (Tr. No.19)

It is located in Tr. No. 19 and 1.10 m to the northwest end of the pt No.11. It is circular on plan with a flat surface and straight sides. The diameter of the pit is 1.25m and its extant depth is 15 cm. This could be identified as a base of a storage bin in association with the pit dwelling complex no. 4.

PIT No.17A

It is located 15 cm to the west of pit no.17. It is irregular in shape. The eastern side is more or less straight whereas the remaining portion is circular It is oriented 10 northeast – southwest. It is 1m by 80 cm and is 25 cm deep. The bottom of the pit is flat and smooth. This could be identified as a container associated with complex4.

Pit-dwelling complex no.5 (Figure 3.3)
(Feature nos.14B, 14, 14A, 14C and 40)

PIT No.14B (Tr. No.16)

Located in trench No.16, this shallow pit can be identified as the pit dwelling of the complex (Figure

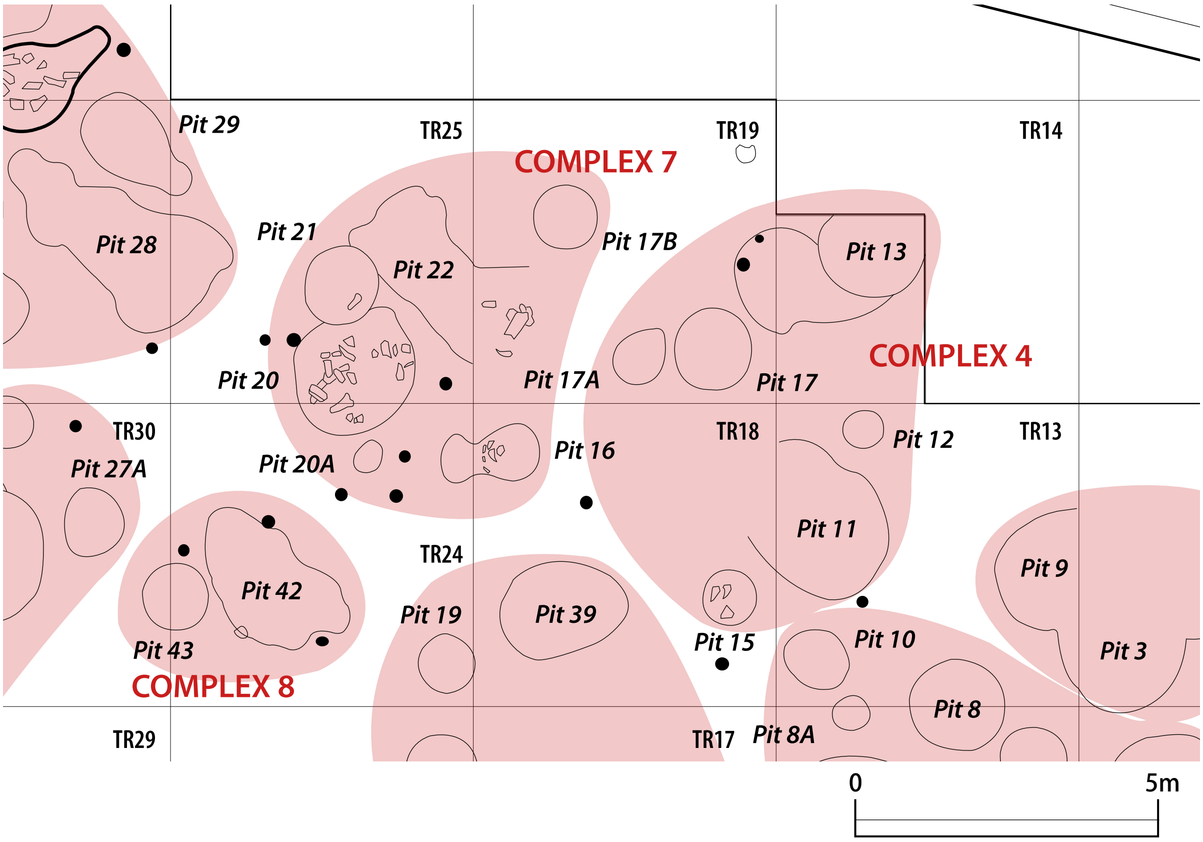


Figure 3.7 Pit-dwelling complex nos.4, 7 and 8

3.8). It is located 80 cm. to the east of the western sections and 21.83 m to the north of the southern section. The pit looks like a 'drop' pendant in shape. It is broad in middle and tapers towards both ends. It is oriented in N-S direction. The northern end is more narrow (40 cm) whereas the southern end is slightly broader (75 cm). Its maximum width in the middle is 1.90 m. The total length of the pit is 3.10 m and 50 cm deep. The southern part of the pit for a length 1.22 m is disturbed by a later pit. The original floor of the pit which is hard, compact and smooth has survived in the northern half. Four postholes are found associated with this pit. Two on the eastern side and two are located on the western side. The ones located on the eastern side are almost the middle of the pit along the edge, 55 cm apart from each other. Both are small (10 cm diameter). The postholes located are the western side are just opposite of the ones located at the eastern side, but the distance between these two is slightly less (30 cm) of the two the one bigger in site 70 cm to the west of the western line of pit 14B. It is circular with a diameter if 16 cm and is 10 cm deep. The other one side small in size is located 70 cm. to the west of the western line of pit 14B has a diameter of 9 cm and depth of 12 cm.

PIT No.14C (Tr. No.16)

It is located 80 cm to the south of the southern end of pit 14B. It is small, circular (40 cm) shallow (7 cm depth) pit with a well made flat and smooth base. This may be identified as a depression to hold a round base jar and forms part of this complex.

PIT No.14A (Tr. No.16)

Located 50 cm to the west of northern end of 14B, this is a small circular and deep pit. Its diameter is 45 cm and depth 20 cm. This also appears to be a base of a round base pot as it gradually slopes towards the base resembling the shape of base of the pot.

PIT No.14 (Tr. No.17)

It is horse shoe shaped pit located 1 m to the



Figure 3.8 Feature no.14B, Pit-dwelling complex no.5, from east



Figure 3.9 Feature no.14, Pit-dwelling comples nos.5 and 6, from south

north of the northern edge of 14B. This is oriented 20° northwest -southeast direction. Its length is 2.20 m and the width 1.45 m and a depth of 50 cm. The base which is uneven contains large number of large charred animal bones (Figure 3.9). This could be associated with this complex and may be identified as a garbage pit.

STORAGE POT

A large storage pot, lower half which has survived is located 1.05 m to the east of the eastern line of pit 14B close to the big posthole at a distance of 48 cm to the north. It is a part of a large globular vessel probably resembling the Hakra mud appliqué ware. The diameter of the pot is 45 cm and is survived to a height of 25 cm.

PIT No.40 (Tr. No.22)

It is located 1.10 m to the north of the southern section along the eastern line of the tr.22. The distance between 14B and this trench is 2.50 m. It is a large circular, shallow pit with a sagging base. The diameter is 1.80 m and 30 cm. deep in the middle. Originally the pit may have been used for storage as it is perfectly symmetrical and the surface is smooth but later when it fell into disuse it was used as a garbage pit as it contains a large number of large animal bones and potsherds.

The dwelling pit of the complex is small. It is quite likely that the open space available within this complex may also have been used for carrying out lot of domestic activities. This open space is made of mud, rammed hard and plastered, suggesting its use for various activities.

Pit-dwelling complex no 6 (Figure 3.3)
(Feature nos. 39, 19, 18 and 14)

PIT No.39 (Tr. No.18)

This appears to be dwelling pit of the complex as it is largest among the pit included in the complex and has a well made floor. It falls in trench 18. It is located 60 cm to the north of the southern line of the trench, 2.90 m to the west of eastern section. It is oriented 50° NE-SW. It measures 2 m by 1.65 m, roughly oval on plan and 12 cm in depth. The sides are perfectly vertical and floor is horizontal and well made even though no post holes are seen, it is quite likely that the superstructure consisted of slanting sticks placed on the periphery and tied together on top. Such type of construction exists even today. In this case the posts are not required to hold the superstructure. This will explain the absence of post holes.

PIT No.19 (Tr. No.24)

It is located to the southwest of 39 at a distance of 65 cm.., circular on plan with a diameter of 80 cm. It is perfectly cylindrical with a flat base having a diameter of 80 cm. It is 50 cm deep. The sides and the base are plastered with clay. This appears to be one of the storage pits of the complex.

PIT No.18 (Tr. No.23)

To the south of pit 19 at a distance of 66 cm. is located another storage pit of the complex slightly oblong in shape. It is located 50 cm to the south of northern section of the trench along the eastern margin. The pit is along in shape 50° NE-SW. It measures 1.20 m by 1 m. It is 70 cm deep. The sides of the pit are smooth and plastered. It appears to be a storage pit. Subsequently after its disuse it was dumped with garbage. It contains base of a globular pot and some charred bones and pottery fragments.

Pit No 14 which is identified as a garbage pit of complex 5 may also have been used by this complex for dumping garbage. It is not very far from pit no. 18. Pit no.14 is located 2.73 m to the east of no.18.



Figure 3.10 Feature nos.20 and 20A, Pit-dwelling comlex no.7, from south



Figure 3.11 Feature no.20A, Pit-dwelling comlex no.7, from south

Pit-dwelling complex no.7 (Figure 3.7)
(Feature nos.20, 20A, 21, 16, 17B and 22)

PIT Nos.20 and 22

They appear to be pit dwellings of this complex (Figure 3.10). Pit No.20 which is located in Tr.24 and 25. It is on the baulk of these two trenches, 1 m to the west of the eastern line of the trench. It is oriented 550 NE-SW. It measures 2.30 m by 2.06 m and a depth of 30 cm. It is roughly oval on plan. The sides and the bottom are well made and plastered. Three post holes are located along the periphery alone and is located near its northern end. It is small, circular with 10 cm diameter. The other two are in the middle of the pit on either side has a diameter of 15 cm. Pit no.22 located 40 cm to the north east of pit 20 is highly irregular in shape; it looks irregular in shape mainly because of the damage of its edge as it is near the metal road. It is a shallow pit lying in parts of trenches 19 and 25. It is oriented almost in E-W direction. It is elongated measuring 4.50 m E-W and width varies from 1.40 m towards the western side, 1.20 m in the middle and 2.70 m in the eastern side. The surface is quite uneven. It is made of rammed earth but has developed depressions at places. In the middle of the eastern side of the pit on the surface lies a charred skull of most probably a nilgai. Besides there are number of charred bone and potsherds lying on the surfing. This uneven pit may have been used for even keeping sheep, goats in the night.

PIT No.21

It is located in the northern end of pit no.20. It lies in tr. 25. It is perfectly circular in shape and has a diameter of 1.15 m. It is 60 cm deep. This cylindrical pit with perfectly vertical sides and flat bottom, smoothened and plastered may have used as storage pit for the complex.

PIT No. 20A

It is in trench 24, 1.30 m west of the eastern line (Figure 3.11), 16 cm to the south of pit 20, slightly oblong on plan, oriented 40° NE-SW measures 50 cm by 40 cm and is 33 cm deep. Sides are smooth and well made. It should be a small storage pit of the complex.

To the east of the post hole located on the eastern margin of pit 20 at a distance of 53 cm is a small post hole line depression, circular in shape (20 cm in diameter) and 15 cm in depth. This could be meant for accommodating a medium sized globular pot. This also could belong to this complex. It lies in the north eastern corner of tr. 24.

PIT No.16

It lies in the north western corner of tr. 18. It is 1.50 m to the east of pit no.20. It is circular on plan with a diameter of 1 m and a maximum depth of 20 cm. As it is directly connected with it no.22, it may have been used for gathering dirty water resulting from the cleaning of pit no.22.

PIT No.17B

This is a shallow circular pit located in the middle of the northern margin of pit no.22. It is directly connected to pit no.22 as there is no margin between them. Pit no.17B is in Tr. 19. It is 1m to the east of western section and 60 cm to the south f northern section. The diameter of the pit is 1.10 m and it survived to depth of 10cm. This may have used as a storage pits.

Pit-dwelling complex no.8 (Figure 3.7)
(Feature nos. 42 and 43)

PIT No.42

It lies in Tr.24. It is located 90 cm to the north of southern section and 30 cm to the east of the western section. Pit is oriented 40° NW-SE and resembles a horse-shoe shape. It measures 2.95 m by 1.60 m. Towards its end it tapers slightly. It is not a pit dwelling in the real sense but is a sunken dwelling as it is hardly 3 cm deep. Even though a depression is seen

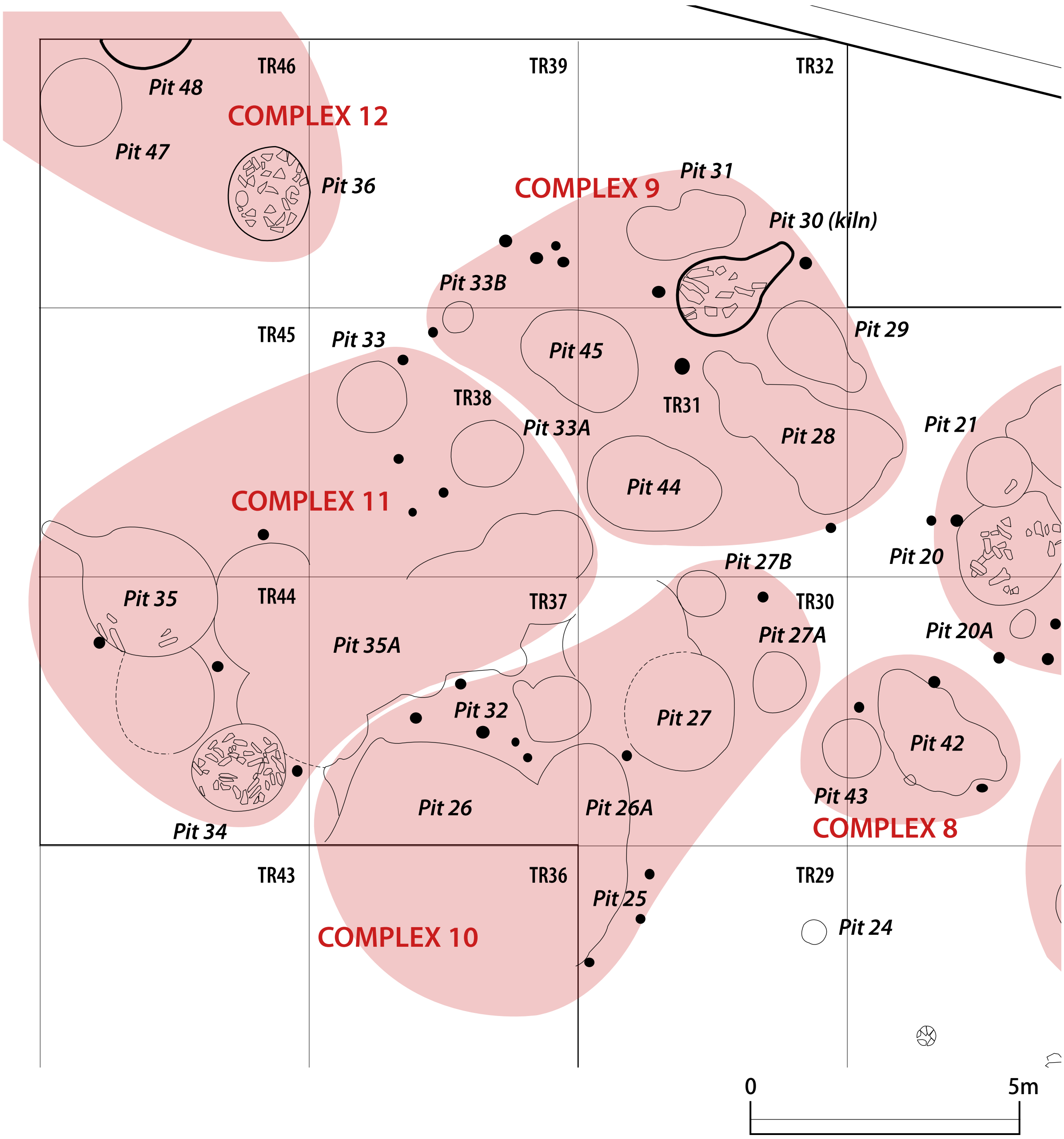


Figure 3.12 Pit-dwelling complex nos.9, 10, 11 and 12

in the middle, it has rammed and smooth floor. Three postholes are located at the periphery on at the tip of southeast end and the other two are on either side of the north western end. The post hole located at the tip of the southeast is 7 cm away from the edge and has a average diameter of 13 cm. It is 8 cm deep. The one located one the eastern side of the northwestern end has a diameter of 20 cm and is 5 cm deep. The one on the western side of the north western end is located 10 cm away from the edge. It is slightly oblong measuring 20 cm by 18 cm and is 9 cm deep.

PIT No.43

It is located by the side of the posthole on the western side of the northwestern end of pit no.42. It lies partly in trench 24 and partly in trench 30. It is 1.30 cm to the north of the south western peg of Tr.24. It is a perfectly cylindrical pit dug into the platform and has a diameter 1.10 m and depth of 50 cm. The sides and the bottom which is slightly concave are perfectly symmetrical and smoothened by plastering with day. This can be related to sunken dwelling 42 as its storage pit is located along its edge.

Pit-dwelling complex no.9 (Figure 3.12)
(Feature nos.28, 29, 30, 31, 45, 44 and 33B)

PIT Nos. 28 and 29

These two rather sunken pits may have been the dwellings of this complex. They are separated by a small ridge which may have acted as a partition between the sunken dwellings. Pit 28 which is in trenches 31 and 35 is highly irregular in shape. Its eastern margin is highly irregular and big. It is roughly oblong on plan oriented 30° NW-SE. It is narrow towards the western end and broad towards the eastern end. It is 3.95 m long and the breadth varies from 1.95m towards eastern end and 75 cm towards the western end. Though the floor is well made, hard and compact it is uneven possibly due to its proximity to the surface which is liable to damage.

The pit no.29 is made of two circles one large and one small. The large circle is located toward the western side and the small towards the eastern side. It is located immediately towards the north of pit 28. It lies in tr.25 and tr. 21. The diameter of the largest circle is 1.50 m whereas that of a smaller circle is 80 cm. Both are connected to each other and therefore appear to be forming slightly bigger sunken dwelling of the complex, like Pit no.28 it is also very shallow (5 cm) and has well made and smooth floor.

Three postholes are found along the periphery of pits 29 and 28, two of which are located on either sides of the northwestern end and one towards the southern side of the south eastern end. The one towards the western side of the northwest end is located at a distance of 40 cm from the edge of the pit 28. It has a diameter of 12 cm and depth of 10 cm. The other one located on the eastern side of the north western end is 60 cm to the north of the edge of pit 29. It is slightly bigger having a diameter of 15 cm and a depth of 12 cm. The third posthole located towards the southern side of south eastern edge of pit 28 is located at a distance of 35 cm from the edge of the pit. It has a diameter of 13 cm.

PIT No.30

This lies in the Tr. 31 and 32, 1.75 m to the west of the north eastern corner of trench 31. This structure which could be identified as a large fire pit is oriented 70° NE-SE. The furnace is circular on plan with a long fire chamber located toward its northeastern side. The diameter of the circular portion of the furnace is 1.50 m from the inner edge. The fire chamber is 1.05 m long. Near its junction with circular position it is 90 cm wide and towards its end it's 45 cm wide. The other edge of the fire chamber is semi circular. This pit has a shape that resembles a 'Yoni'. The circular position had a thick wall of mud (10 cm thickness). It is survived to a depth of 50 cm now. It is highly possible that the wall was quite high which collapsed the remains of which were found inside the Kiln. However the height of the original wall cannot be reconstructed at this stage. The fire chamber gradually slopes towards the centre portion of the fire pit. Near its end it is 13 cm deep whereas near the junction with the circular portion it is 45 cm deep. The circular wall of this feature was made by placing clay coils vertically as the inner surface looks fluted. This was build in situ and the fire chamber was dug in the ground in a sloping manner and plastered. In the centre of the feature is located a large circular stem made of large clay bun shaped lumps, two courses of which are seen here. These large blocks of bun shaped clay lumps were set in mud mortar and the entire stem was plastered with a thick (3 cm) clay coating. This stem is located 50 cm from the eastern edge of the circular portion and 35 cm from the western section of the circular portion. The stem is roughly circular with a diameter of 65 cm. The top of the stem is its northwestern side, which is survived to a height of 48 cm. The base of the circular portion feature is perfectly horizontal made with their coating of clay lining. The sides, base, and the clay stumps have been fully burnt and they all look red. The entire feature burnt red has hardened like a stone. Inside the feature mostly in the circular portion were found a small layer 7 cm thick of ash over which were found the collapsed fragments of

either wall or stem located in the centre. The burnt clay lumps found inside have traces of wheat, barley in the clay have been confirmed by Dr. Kajale. (The total length of the feature from the tip of fire chamber to the circular end is 2.42 m). Should be shifted to the measurement position. It appears that the wheat, barley and rice husks were added in the clay used for building this feature. The exact function of this fire pit is difficult to understand considering the presence of stem in the centre which may have been meant to support large vessel, it appears to be a large cooking place for the community. No traces of any industrial activity have been found inside the fire pits.

This fire pit has been included in the pit dwelling complex no. 9 but it appears that it was later in date than the pits located around it. It is unlikely that any activity will take place in the immediate vicinity of the fire pits as the intensity of the fire will prevent this.

PIT No.31

Located in Tr.32 is situated immediately to the north of the fire pit it is separated by irregular line, the thickness of which varies from 45 cm towards the western side and 23 cm towards the eastern side. This is highly irregular, oriented E.W. It is 2 m long (E-W). The width varies from 1 m towards the western side to 60 cm towards the eastern side. It is survived to a depth of 10 cm. Same domestic activity has been carried out in this pit as it has well-made smooth floors.

PIT No.45

This pit which lies between Tr.31 and 38 is also made of two slightly irregular pits joined together (Figure 3.13). It is situated 66 cm to the southwest of the fire pit (no.30). It is oriented E-W with smaller circle on the western and the bigger circle on the eastern side. The total length of the pit is 2.47 m. The bigger circle is roughly oval in plan measuring 1.96 m (northeast – southwest) by 1.60 m (northwest - southeast). The smaller circle has longer axis in N-S direction measuring 1.55m by 1 m (E-W) The maximum depth near the southwestern edge is 10 cm. Considering the nature of the floor which is hard compact and smooth, this also could have been used for some domestic activity.

PIT No.44

Lies in Tr.31, 12 cm to the east of western line and 90 cm to the north of southern line. The distance between pit 44 and 45 is 85 cm and pit 28 and 44 is 75 cm. The pits are oriented E-W. It is an oval pit measuring 2.40 m (E-W) by 1.50 m (N-S) and is 35 cm deep. The sides and the bottom are perfectly symmetrical, smoothened and plastered. This could have been the storage pit of the complex.

The area outside the pits in this complex is very well made and smooth. Lot of activities must have been carried out in this open space also.

PIT No. 33B

This pit lies in Tr. 38, 70 cm west of pit 45. It is a circular concave based shallow pit (Figure 3.17). The diameter is 47 cm and depth in the centre is 8 cm. This could be used as a base for a round based pot belonging to complex no.9.

Pit-dwelling complex no. 10 (Figure 3.12)
(Feature nos.27, 27A, 27B, 32, 26, 25 and 26A)

PIT No.27

It is located in Tr. No.30 and 37 it is oriented 30° northwest – southeast. It is oval in plan (Figure 3.14). It is 4m (NW) by 2.50 m (SE); the southeast end is perfectly Semi circular lined with burnt clay lumps. The floor which is at a depth of 9 cm is slightly concave in the middle. It is well-made, plastered and appears to have been a proper dwelling floor. Two postholes are seen associated with this pit. One located on the south western side and the other on the northeastern. The one on the SW is located 25 cm away from the edge of the pit. With a diameter of 12 cm and a depth of 10 cm. The other one is 50 cm to



Figure 3.13 Feature nos.44 and 45, Pit-dwelling comlex no.9, from north



Figure 3.14 Feature no.27, Pit-dwelling comlex no.10, from north

the east of 27B and 1.20 m to the NE from the edge of Tr. 27 with a diameter of 10 cm.

PIT No.27 B

Located immediately to the northeast of Tr.27 is directly connected to Tr.27 as there is no separating line between them. It lies in Tr.30. The pit is circular on plan with a diameter of 80 cm. It is survived to depth of 12 cm. This appears to be a small storage pit the side and the bottom is well made and plastered.

PIT No.27A

It is located 20 cm to the east of Tr. 27 in Tr. 30. It is an oblong pit oriented 20° NW-SE. It measures 1.20 by 1.10 m. It is slightly 'yoni' shaped. The sides and bottom were well-made and plastered and to a depth of 15 cm. The surface of the base of the pit appears to be used for domestic activity and since it is close to pit 27 it can directly be related to it.

PIT No.26A

It is located half in Tr.30 and the other half in Tr.37 close to the southeast peg of Tr.37. It is semi-circular on plan. The straight line running in the N-S direction of the pit is 1.80 m long and the diameter of the Semicircle is 1.90 m. It is 35 cm to the southwest of pit 27. The pit is hardly 5 cm deep but has a well made base which could have been used for some domestic activity. This pit which is in proximity of pit 27 may have formed a part of this complex.

PIT No.32

To the North West side at a distance of 15 cm of pit 26A is located pit no.32. The eastern edge of pit merges with the floor of pit 27. It is situated along the western line of Tr.37 almost in the middle of the trench line It is circular on plan with a diameter of 1.15 m and a depth of 7 cm. This may have been an extension of pit dwelling no.27 as the same kind of floor as that of pit 27 extends to this pit also. To its southwestern margin at a distance of 30 cm is a posthole, 15m in diameter and 10 cm deep. This could be associated with the dwelling complex formed by pit 27 and 32.

PIT Nos.25 and 26

Two circular pits joined together form this pattern which is on the southwestern margin of 26A. It is situated partly in Tr. 29, 36 and 37. These two pits form a long elongated dwelling structure which is oriented 30° northwest – southeast. This is very shallow hardly 5 cm deep but has a well made floor. It measures 4.60 by 2.50 m. One big posthole along the northern margin which is 20 cm away from the edge could be associated with this pit. It is 22 cm in diameter and 15 cm deep. Three post holes can be seen along the southern margin located equidistant from each other. The middle one is exactly 25 cm due east of the edge of Pit 25 with 12 cm diameter and 7 cm depth. The other one is located 90 cm to the southwest of the middle posthole and hardly 10 cm away from the edge of pit 25. It has a diameter of 15 cm and 7 cm deep. The third one is 80 cm to the north of the middle one and 25 cm to the cast of the margin of pit 25, the diameter is 10 cm and 7 cm deep. This long pit may have been another pit dwelling of the same complex as it has smooth and well made floors, large in size and few postholes along its periphery.

Pit-dwelling complex no.11 (Figure 3.12)
(Feature nos.35A, 35, 34, 33A, and 33)

PIT No.35A

It is located in Tr. 37, 38, 44, 45. It is a highly irregular shallow pit running in E-W direction. It appears to be made up of three circles attached to each other as it form three arches on either side and curves on either ends. The total length is 5.65 m. The width varies from 2.30 m towards eastern end, 2.60 m in the middle and 2.45 m towards western end. The entire complex has a slightly concave smooth and well made floor. The average depth in the centre is 15 cm and floor starts rising towards the periphery.

Six postholes are noticed along the periphery. Three on the southern side and one in the southwestern and two on the northern side of the three postholes located on the southern side, the easternmost is 22 cm away from the southern edge and 1.10 m west of the eastern end. It has a diameter of 10 cm and depth of 10 m. The middle one is 1.25 m to the south west of the first one and 5 cm away from edge of pit 35A. The diameter is 15 cm and depth is 10 cm. The third one is 1.85 m southwest of the middle one almost at the edge of pit 35A. The diameter is 15 cm and depth is 10 cm. The one on the southwestern side is 35 cm away from edge of 35A and 2.20 m to the northwest from the last posthole on the southern side. It has a diameter of 12 cm and a depth of 5 cm. Among the two located on the northern side, the one towards west is hardly 7 cm away from the edge having a 15 cm diameter and a depth of 10 cm. The other one is 3.15 m to the northeast of the western-most posthole on the northern side. It has a diameter of 15 cm and depth of 17 cm.

PIT No.35

The large circular pit located immediately to the west of 35A is separated by a thin (7 cm) clay lining. The diameter is 2.40 m and has a depth of 15 cm. The pit has a large number of charred bones and pottery pieces and the impressions of reed. This appears to be an extension of pit dwelling 35A as it is perfectly circular.

PIT No.34

This pit lies in Tr. 44. It is 1.10 m to the south of the western end of pit 35A. It is an oval pit. It is Oriented towards N-S measuring 1.80 by 1.40 m. The pit was full with charred animal bones mostly long bones probably of cattle (Figure 3.15). This could be identified as a garbage pit of the complex. The bones were noticed almost at the top of the pit.

PIT No. 33A

It is to the north of the eastern end of pit 35A at a distance of 50 cm. It lies in Tr. 38. It is perfectly circular (1.25 m diameter) and sides are perfectly vertical and the base is perfectly flat (Figure 3.16). It is 25 cm deep. The sides and the bottom are plastered with clay. This could be the storage pit of the complex.

PIT No.33

Located slightly towards the NW of pit 33A at a distance of 1m. It is situated in Tr.38. It is 70 cm to the east of western line and 1 m to the south of northern trench line. It is very shallow (5 cm deep) circular on plan with a diameter of 1.35 m. Floor of the pit is well made. There are two postholes, one on the northern and the other on the south side of pit 33. The one on the northern side is 8 cm away from the edge of pit 33 with a diameter of 12 cm. The one on the southern side is 30 cm away from edge of pit 33 and has a diameter of 10 cm and depth of 8 cm. Considering the fact that it has a well made floor and two postholes, it is quite likely that it was used for some domestic purpose. This also belongs to the pit dwelling complex 11.

Pit-dwelling complex no.12 (Figure 3.12)
(Feature nos.36, 47 and 48)

Only three features of this complex have been excavated. Feature no.48, partially excavated, could be the main pit-dwelling of this complex. This complex may belong to a potter, as Feature no.36 is a pottery kiln of the complex. Feature no.47 may have been used for some domestic activities.

PIT No.36

It is located in the Tr. 46 along the eastern margin of the trench at a distance of 1.25 m from the southern line. It is a small pottery kiln roughly oval in plan but slightly irregular (Figure 3.18). It is N-S oriented measuring 1.70 by 1.45 m. It is survived to depth of 35 cm. It has a concave base slightly deep in the centre, the base and the sides of the pit are burnt and the



Figure 3.15 Feature no.34, Pit-dwelling comlex no.11, from south



Figure 3.16 Feature no.33A, Pit-dwelling comlex no.11, from north



Figure 3.17 Feature no.33B, Pit-dwelling comlex no.9, from the above



Figure 3.18 Feature no.36, Pit-dwelling comlex no.12, from south

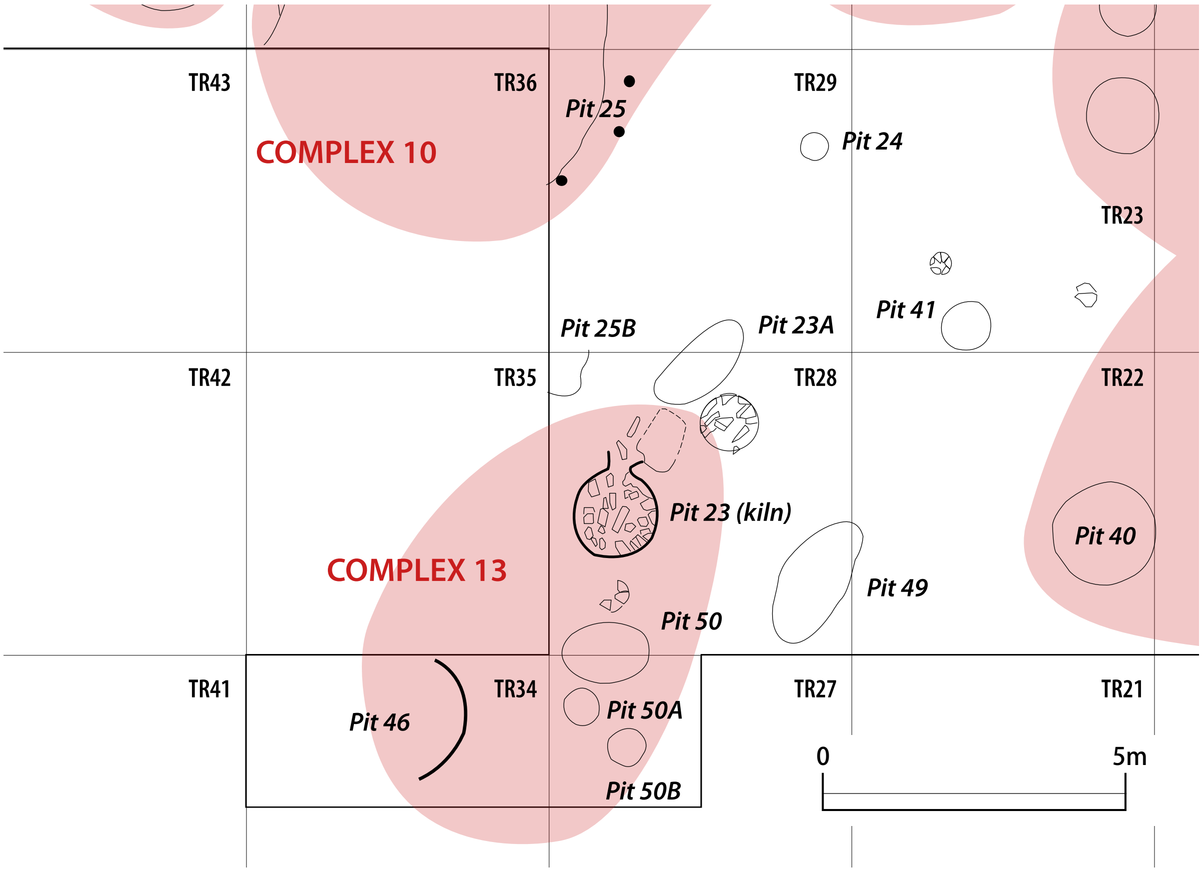


Figure 3.19   Pit-dwelling complex no.13

sides of the pit are burnt red. It contains large number of broken pots of different varieties, burnt clay lumps and circular clay cushion. One of the clay cushions survived and has a diameter of 25 cm. It appeared that the large storage jars were kept on these cushions vertically for firing. Most probably the house complex of a potter was located 30° to its northwestern side represented by two pits numbered 47 and 48 which have been partially excavated. These pits are located at a distance of 2.10 m.

PIT No.47

It is located at the northwestern corner of Tr.46. It appears to be oval in plan and oriented 40° NW-SE. It has been excavated to a length of 1.50 m. The southeastern circular end has a diameter of 1.55 m. The pit has uneven but hard floor and a depth of 12 cm.

PIT No.48

It is located immediately to the northeast of pit 47, 1.10 m to the east of north western corner alone the northern line. This appears to be large circular pit dwelling 1/3 of which have been partially excavated here. The pit is lined with burnt clay lumps and is 17 cm deep. It has been excavated over an area of 1.90 m (along north section line) and 55 cm on the southern side of the northern trench line. The exact diameter cannot be measured. As it has rammed floor, it could possibly be used for dwelling purpose.

PIT-DWELLING COMPLEX NO.13 (Figure 3.19)
(Feature nos.23a, 50, 50A, 50B and 46)

This complex consisted of a pit-dwelling (Feature no.46), storage pits (Feature nos.50, 50A and 50B), a pottery kiln (Feature no.23) and a storage jar. Feature no.46 (Trench no. 34), though disturbed to a great extent, appears to be a large circular pit, only a small crescent-shaped portion of which is visible. It is lined

with clay plaster of 10 cm thick. The diameter of the crescent is 1.70 m. The clay lining of the pit was burnt red suggesting that it was perhaps destroyed by fire. This pit may have been a large pit-dwelling of the complex but the present data cannot confirm this. The storage jar, which lies in Trench no.28, is located 70 cm east of the northeastern corner of the pottery kiln (Feature no.23) belonging to this complex. It is a large pot crushed into pieces but the circumference of the pit which is 65 cm could define the size of the jar. The pit is tapering at the base which suggests that the storage jar also was narrow towards the west. It is 40 cm deep.

PIT No.23A

It is located immediately to the north eastern side of the fire chamber, 20 cm away. It is an oblong pit oriented NE-SW direction and falls in Tr.28 and 29. It is 1.85 m long and 80 cm wide. The depth is 5 cm. The base of the pit is uneven and slightly loose. This may have been a later pit, not associated with the complex.

STORAGE JAR

A storage jar lies in Tr.28, this storage jar is located to the 70 cm east of the northeastern corner of the fire chamber of the fire pit. It is large pot situated 80 cm to the south of the northern section and 1.50 m to the west of the eastern section of Tr.28. The entire pot is broken into pieces but the circumference of the pit which is 65 cm could also be the circumference of the jar. The pit is tapering at the base which suggests that the storage jar also was tapering towards the west. It is 40 cm deep. This pot could belong to the complex.

PIT No.49

This could be a later pit not associated with this complex. It is oriented 150 NE-SW elongated in shape. The southern end touches the southern line of Tr 28 whereas the northern end touches the eastern line of the trench. It is 90 cm wide and depth varies from 5 to 15 cm. This highly uneven pit could have been used for garbage purpose. At the base of the pit are found hard clay lumps.

PIT No.50

Located on the margin of Tr.27 and 28, 15 cm to the east of the western section and 1.10 m to the south of the edge of the pit no23. This is an oval pit oriented 40° NE-SW. It measures 1.20 by 1.05m. It has a depth of 45 cm. The sides and the bottom are well plastered and could be identified as the storage pit of the complex.

PIT No.50A

It is situated 20 cm to the south of pit 50 and 25 cm to the east western section of Tr.27. It is a small circular (diameter 45 cm) and shallow (10cm) pit. The sides and the bottom which is slightly well made have been the base of a storage jar.

PIT No.50B

It is situated 95 cm to the south of pit 50 and 85 cm to the east of western section of Tr.27. It is a cylindrical pit with a diameter of 50 cm and a depth of 35 cm. The sides are perfectly vertical and have a slightly concave base; both are well made and plastered suggesting it to be a storage pit of the complex.

PIT No.46

Pit 46 lies in Tr.34 and is badly disturbed most probably it was a large circular pit, only a small crescent of which is visible 1.18m to the west of eastern section of Tr.27. It is 30 cm to the south of the northern section of Tr.34. The pit was lined with their clay which was 10 cm thick. The diameter of the crescent is 1.70m. The clay lining of the pit are burnt red suggesting that it was perhaps disturbed by firing. This pit may have been a large pit dwelling of the complex which cannot be confirmed.

PIT No. 24 (Tr.29)

It is a small depression made to accommodate a medium sized globular pot and is located in Tr.29, 30

cm to the west of the eastern line and 1.45m to the south of the northern section. The diameter of the pit is 33 cm. It has a concave base which is 15 cm deep in the center. This is an isolated pit which cannot be related to any in the existing complex.

PIT No.41 (Tr.25)

Situated along the southern edge of Tr.23, it is 1.45 m east of the western link. It is a circular pit with a diameter of 67 cm. The slightly concave base of the pit is located at the depth of 26 cm. The side and the bottom are well made. This could be a storage pit of the complex, probably located on the western side which is not excavated.

STORAGE POT

To the north of Pit 41 at a distance of 55 cm and 1.26 m to the east of the western section of Tr.23 lies a medium sized globular pot. It is a plain ware pot, the circumference of which is 40 cm. This could be part of the complex of which 41 has one of the pit.

Pottery kiln (Figures 3.19 - 3.21)
(Feature no. 23)

Feature no.23 (Trench no.28) is a pottery kiln. This pottery kiln discovered at the site, which is circular in plan and has a long rectangular fire chamber, can be associated with the Pit-dwelling complex no.13. The diameter of the circular pottery kiln is 1.30 m. It has a clay wall made of vertical clay coils, the average thickness of which is 9 cm. The wall has existed to a maximum height of 22 cm. The fluted inner surface of the fireplace is exactly similar to that of another pottery kiln (Feature no.30). Inside the kiln, almost in the centre, are located two rectangular slabs placed horizontally. The eastern slab is located 32 cm to the west of the inner edge of the kiln on its eastern side and 22 cm to the north of the southern edge of the kiln. The slab measures 45 cm in length, 27 cm in height and 13 cm in width. The other slab located on the western side is exactly parallel to the one on the eastern side but has only partially survived. This is also oriented in the north-south direction. The southern end is 25 cm to the east of the western edge. The broken piece of this stand remains to a length of 18 cm. This slab could also have been exactly similar in measurement to the one on the eastern side. The distance between the two slabs is 33 cm. The opening of this fire place is 40 cm wide. The ends project outwards towards the northeastern direction and they are both 20 cm long. The inner surface of the opening was plastered. The fire chamber, made of rough rectangular clay lumps, is 1.10 m in length from the opening edge of the fire place. It is 55 cm broad. Inside the kiln were found burnt lumps of the clay wall, which contains impressions of rice, wheat and barley.

Pottery kiln (Figure 3.22)
(Feature no.30)

Feature no.30 is another pottery kiln (Trench nos.31 and 32). This pear-shaped feature, which could be identified as a pottery kiln, is oriented 70° from northeast to southeast. The kiln is circular, 1.50 m in diameter in plan, with a long fire chamber, 1.05 m in length, located toward its northeastern side. Near its junction inclusive of the circular position, it is 90 cm wide and 45 cm wide towards its end. The kiln was made in situ of a mud wall, 10 cm in thickness, which is survived to a depth of 50 cm. It was made by placing clay coils vertically making the inner surface look fluted. It is possible that the wall was quite high when constructed, and when it collapsed the remains accumulated inside the kiln. However the height of the original wall cannot be reconstructed at this stage. The fire chamber gradually slopes towards the central portion of the fire pit. In the centre of the feature is located a large circular stem, 65 cm in diameter, made of two courses of large bun-shaped clay lumps set in mud mortar and plastered. The burnt clay lumps found inside have traces of wheat, barley and rice in



Figure 3.20 Feature no.23, pottery kiln, from west



Figure 3.21 Feature no.23, pottery kiln, from north



Figure 3.22 Feature no.30, pottery kiln, from southwest



Figure 3.23 Mud brick structure

the clay, being confirmed by Drs. Saraswat and M.D. Kajale (personal communication). The total length of the feature from the tip of the fire chamber to the circular end is 2.42 m. It appears that the wheat, barley and rice husks were added to the clay and used while building this feature. This could be identified as a pottery kiln as similar kilns have been reported from a number of Early -Harappan sites in India.

This kiln has been included in the Pit-dwelling complex no.9, but it appears that it is later than the features located around it. It is unlikely that any activity could take place in the immediate vicinity of the fire pits as the intensity of heat produced would prevent other simultaneous activities.

Mud brick structure (Figure 3.23)

At Girawad, the survey across the road revealed the presence of mud-brick walls. The wall made of bricks in the size of the typical Early Harappan ratio of 1:2:3, appears to be of a large structure as it is quite wide (1.20 m). It is survived to a length of almost 3 m. The remains of bricks were found at the base of the habitation and thus contemporary with those pit-dwelling complexes found on the other side of the dividing road. This evidence suggests that the Hakra culture people at the site have also built mud brick houses. It is quite likely that the area south of the road was occupied by the craftsmen, particularly the potters, whereas the people of the higher social ranking lived on the northern side of the road. The complexes occupied by the craftsmen were provided with storage facility. There was greater need of storage in the dwellings of the craftsmen as they were paid in kind for their services to the community.

References

Rao L.S., N.B. Sahu, Prabash Sahu, Samir Diwan and U.A. Shastry (2004) New Light on the Excavation of the Harappan Settlement at Bhirrana. *Purātattva* 35: 60-68.

Shinde, V., T. Osada, M.M. Sharma, A. Uesugi, T. Uno, H. Maemoku, P. Shirvalkar, S.S. Deshpande, A. Kulkarni, A. Sarkar, A. Reddy, V. Rao and V. Dangi (2008) "Exploration in the Ghaggar Basin and excavations at Girawad, Farmana (Rohtak District) and Mitathal (Bhiwani District), Haryana, India", in T. Osada and A. Uesugi (eds.) *Occasional Paper 3: Linguistics, Archaeology and the Human Past*. Indus Project, Research Institute for Humanity and Nature, Kyoto. pp.77-158.

CHAPTER 4

POTTERY

BY AKINORI UESUGI

1 OUTLINE

In total, 1355 potsherds were documented among the total number of potsherds recovered from the excavations. Whereas a few specimens are well preserved and show their entire shapes, most specimens are small fragments that do not permit us to see their original shapes. This poor preservation is observed in all forms. Tables 4.1 - 4.2 shows the numbers of fragments portion-wise. The rim sherds designate to those with rims, whether or not they are intact either only with rims or with body or base portions as well as rims. The base sherds are those with a base, some of which are preserved up to the body portions, but not to the rims. The body sherds represents only body portions and do not include rims and bases. The descriptions and analyses in this report are based on these specimens having many limitations.

The documented specimens were selected for their formal and technical features. Even if it was a tiny fragment, it was chosen for documentation if it exhibited a feature that is relevant to our understanding of pottery from the site. Only tiny fragments with no features were rejected. As a result, the total number of 1355 documented specimens can cover the all contexts and types of the pottery at the site.

Among the total number of documented specimens, 1276 are derived from pits of various nature and 79 are from occupational layers. All sherds from pits were carefully selected for documentation. The number of documented specimens varies from one pit to another. A couple of pits yielded a good number of potsherds, while others provided no sherds or a negligible number. This difference in the number of sherds may reflect post-depositional processes after their discard.

The potsheds from the site can be classified into the following groups.

Red ware	1325
Grey ware	28
Black-and-Red ware	2
Total	1355

The scale-drawings of pottery are basically illustrated in 1/3 (one thirds) of the original size. Some illustrations of large vessels are shown in 1/4 (one fourth) as indicated in the illustrations of those specimens. For the key for these illustrations, see below.

Key for illustrations of pottery

white slip

red slip

grey slip

black slip

Table 4.1 Numbers of documented sherds (Red ware)

	no of sherds	RW														
		Total	**Pot**				**Bowl**		**Base**	**Dish-on-Stand**				**Handle**	**Spouted vessel**	
			Total	R	BD	BS	Total	R	Total	Total	R	BD	BS	Total	Total	BD
Total	1355	1325	868	334	532	4	231	231	205	7	0	3	3	13	1	1
Pit 1	32	32	24	14	10	0	3	3	5	0	0	0	0	0	0	0
Pit 5	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0
Pit 6	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0
Pit 7A	15	15	7	3	4	0	4	4	3	1	0	1	0	0	0	0
Pit 8	32	31	18	4	14	0	8	8	5	0	0	0	0	1	0	0
Pit 8A	15	13	4	2	2	0	6	6	3	0	0	0	0	0	0	0
Pit 10	25	25	17	6	11	0	6	6	2	0	0	0	0	0	0	0
Pit 11	95	93	58	37	21	0	27	27	5	1	0	0	1	1	0	0
Pit 13	38	38	25	11	14	0	9	9	4	0	0	0	0	0	0	0
Pit 14	110	108	80	24	54	2	15	15	11	0	0	0	0	3	0	0
Pit 15	17	17	5	0	5	0	8	8	4	0	0	0	0	0	0	0
Pit 16	44	44	26	10	16	0	11	11	7	0	0	0	0	0	0	0
Pit 18	43	43	27	14	12	1	5	5	10	0	0	0	0	0	0	0
Pit 19	5	5	3	2	1	0	1	1	1	0	0	0	0	0	0	0
Pit 20	72	68	35	9	26	0	18	18	9	0	0	0	0	1	0	0
Pit 20A	10	10	3	2	1	0	2	2	5	0	0	0	0	0	0	0
Pit 21	41	41	30	13	17	0	3	3	7	1	0	0	1	0	0	0
Pit 22	15	14	10	4	6	0	1	1	3	0	0	0	0	0	0	0
Pit 23	53	53	34	9	25	0	8	8	11	0	0	0	0	0	0	0
Pit 25	9	9	5	3	2	0	2	2	1	0	0	0	0	1	0	0
Pit 26	48	47	36	17	19	0	6	6	6	0	0	0	0	0	0	0
Pit 27	2	2	0	0	0	0	1	1	1	0	0	0	0	0	0	0
Pit 27A	14	14	10	7	3	0	3	3	1	0	0	0	0	0	0	0
Pit 28	9	8	6	2	4	0	1	1	1	0	0	0	0	0	0	0
Pit 32	6	5	4	2	2	0	1	1	0	0	0	0	0	0	0	0
Pit 33	13	12	7	2	5	0	4	4	1	0	0	0	0	0	0	0
Pit 33A	32	32	20	7	13	0	6	6	6	0	0	0	0	0	0	0
Pit 33B	7	7	5	2	3	0	1	1	0	0	0	0	0	1	0	0
Pit 34	72	72	53	16	37	0	8	8	10	1	0	1	0	1	0	0
Pit 35	59	58	43	17	26	0	5	5	10	0	0	0	0	0	0	0
Pit 36	49	48	43	17	25	1	0	0	5	0	0	0	0	0	0	0
Pit 38	12	12	9	1	8	0	1	1	2	0	0	0	0	0	0	0
Pit 38A	54	50	33	13	20	0	10	10	7	0	0	0	0	2	0	0
Pit 39	14	14	7	2	5	0	2	2	4	0	0	0	0	1	0	0
Pit 40	51	51	36	8	28	0	10	10	6	0	0	0	0	0	0	0
Pit 43	18	15	10	7	3	0	4	4	0	1	0	1	0	0	0	0
Pit 44	40	40	24	2	22	0	0	0	16	0	0	0	0	0	0	0
Pit 46	10	10	4	1	3	0	4	4	2	0	0	0	0	0	0	0
Pit 49	2	2	1	1	0	0	0	0	1	0	0	0	0	0	0	0
Pit 50	27	26	11	8	3	0	6	6	8	0	0	0	0	0	1	1
Pit 100	61	59	41	8	33	0	6	6	11	1	0	0	0	0	0	0
Trench 13	13	13	9	3	6	0	3	3	1	0	0	0	0	0	0	0
Trench 19	50	48	29	16	13	0	9	9	8	1	0	0	1	1	0	0
Trench 31	3	3	3	0	3	0	0	0	0	0	0	0	0	0	0	0
Trench 37	12	12	8	4	4	0	2	2	2	0	0	0	0	0	0	0
uncertain	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0
Total	1355	1325	868	334	530	4	231	231	205	7	0	3	3	13	1	1

Table 4.2 Numbers of documented sherds (Grey ware and Black-and-Red ware)

	no of sherds	GW										BRW
		Total	Pot			Bowl			DoS		Pot or Bowl	Pot or Bowl
			Total	R	BD	Total	R	BD	Total	BS	Total	Total
Total	1355	28	3	1	2	17	15	2	1	1	7	2
Pit 1	32	0	0	0	0	0	0	0	0	0	0	0
Pit 5	2	0	0	0	0	0	0	0	0	0	0	0
Pit 6	3	0	0	0	0	0	0	0	0	0	0	0
Pit 7A	15	0	0	0	0	0	0	0	0	0	0	0
Pit 8	32	1	0	0	0	1	1	0	0	0	0	0
Pit 8A	15	2	0	0	0	2	2	0	0	0	0	0
Pit 10	25	0	0	0	0	0	0	0	0	0	0	0
Pit 11	95	2	0	0	0	2	2	0	0	0	0	0
Pit 13	38	0	0	0	0	0	0	0	0	0	0	0
Pit 14	110	1	1	1	0	0	0	0	0	0	0	1
Pit 15	17	0	0	0	0	0	0	0	0	0	0	0
Pit 16	44	0	0	0	0	0	0	0	0	0	0	0
Pit 18	43	0	0	0	0	0	0	0	0	0	0	0
Pit 19	5	0	0	0	0	0	0	0	0	0	0	0
Pit 20	72	3	0	0	0	1	1	0	0	0	2	1
Pit 20A	10	0	0	0	0	0	0	0	0	0	0	0
Pit 21	41	0	0	0	0	0	0	0	0	0	0	0
Pit 22	15	1	0	0	0	1	1	0	0	0	0	0
Pit 23	53	0	0	0	0	0	0	0	0	0	0	0
Pit 25	9	0	0	0	0	0	0	0	0	0	0	0
Pit 26	48	1	0	0	0	1	1	0	0	0	0	0
Pit 27	2	0	0	0	0	0	0	0	0	0	0	0
Pit 27A	14	0	0	0	0	0	0	0	0	0	0	0
Pit 28	9	1	0	0	0	1	1	0	0	0	0	0
Pit 32	6	1	0	0	0	0	0	0	0	0	1	0
Pit 33	13	1	0	0	0	0	0	0	0	0	1	0
Pit 33A	32	0	0	0	0	0	0	0	0	0	0	0
Pit 33B	7	0	0	0	0	0	0	0	0	0	0	0
Pit 34	72	0	0	0	0	0	0	0	0	0	0	0
Pit 35	59	1	0	0	0	0	0	0	0	0	1	0
Pit 36	49	1	0	0	0	1	1	0	0	0	0	0
Pit 38	12	0	0	0	0	0	0	0	0	0	0	0
Pit 38A	54	4	0	0	0	3	2	1	0	0	1	0
Pit 39	14	0	0	0	0	0	0	0	0	0	0	0
Pit 40	51	0	0	0	0	0	0	0	0	0	0	0
Pit 43	18	3	2	0	2	1	1	0	0	0	0	0
Pit 44	40	0	0	0	0	0	0	0	0	0	0	0
Pit 46	10	0	0	0	0	0	0	0	0	0	0	0
Pit 49	2	0	0	0	0	0	0	0	0	0	0	0
Pit 50	27	1	0	0	0	1	0	1	0	0	0	0
Pit 100	61	2	0	0	0	0	0	0	1	1	1	0
Trench 13	13	0	0	0	0	0	0	0	0	0	0	0
Trench 19	50	2	0	0	0	2	2	0	0	0	0	0
Trench 31	3	0	0	0	0	0	0	0	0	0	0	0
Trench 37	12	0	0	0	0	0	0	0	0	0	0	0
uncertain	1	0	0	0	0	0	0	0	0	0	0	0
Total	1355	28	3	1	2	17	15	2	1	1	7	2

2 RED WARE

2.1 Outline

Red ware can be grouped into painted and unpainted specimens. However, it should be kept in mind that this classification scheme is subject to a the limited representation of each sherd. That is, plain body or base fragments of a vessel may have been painted but the rim portion from the same vessel might not have. Therefore this classification is in some sense qualitative.

In terms of forms, the Red ware can be categorized into Pots or Jars, Bowls, Dish-on-Stands and Spouted Vessels. Among them, the Pots or Jars are dominant, followed by Bowls. The Dish-on-Stands and Spouted Vessels are very limited in number. In addition to these forms, there are a fair number of base fragments that belong to either Pots or Bowls. Handle fragments are also present and may have been attached to Pots or Bowls.

Painted sherds can be classified into monochrome specimens which are painted in black on the red surface, and polychrome specimens which are executed in black and white. The former outnumber the latter. In some specimens, white slip is applied restrictedly to the neck or the upper part of the vessels giving an appearance of polychrome painting in combination with black bands. These specimens are excluded from the polychrome ones. In other words, those categorized here as the polychrome are represented by the specimens that are painted with some geometric or figurative motifs on the body.

For black-on-red painted pottery, the dominant pattern is horizontal band(s), narrow or wide, which occur in every part of the vessel, that is the rim, neck, and body. In addition to the bands, some specimens exhibit other geometric or figurative motifs. The geometric motifs include adjoining semicircles, circles or loops that occur on the internal side of the rim, wavy or small loops that are painted on the external side of the body, mostly in combination with horizontal bands, and other rare motifs like hatched triangles and vertical or oblique strokes. Figurative motifs are very rare and consists of horn-like motif and plant motif.

Those with polychrome paintings exhibit some motifs depicted over a wide area of the body portions of vessels. Therefore only a part of the entire motif is preserved on the surface as they occur in a small sherds. The most recurrent motif consists of a pair of lenticular stokes with white filling. One specimen may represent a floral motif. Another specimen exhibits a pentagonal motif that is comparable to a example from the site of Kunal in Haryana.

The unpainted pottery includes completely plain sherds only with red or white slip and those that are odorned by incise decorations. Those with parallel grooves on their external sides of the bodies are also in this group.

In addition to decorations, a slurry is applied to the external surface of vessels on a fair number of specimens. In some, the slurry is thin and in others it is very thick.

In terms of manufacturing technique, two types can be observed, one using rotational and non-rotational techniques and another solely using rotational techniques. However, this classification also has its limitations due to the fragmentary nature of the artefacts. In the former type, the rim-neck portion is finished by smoothing with rotation and the body is by smoothed or scraped without rotation. Some specimens of this type exhibit traces of luting to build the entire shape. The streak burnishing technique is also applied to the surface in some specimens of this type. In those that were made wholly with rotational techniques, sharp and parallel striations are observed on the surface. They are quite even in thickness regardless of the portion of the vessel from which they come.

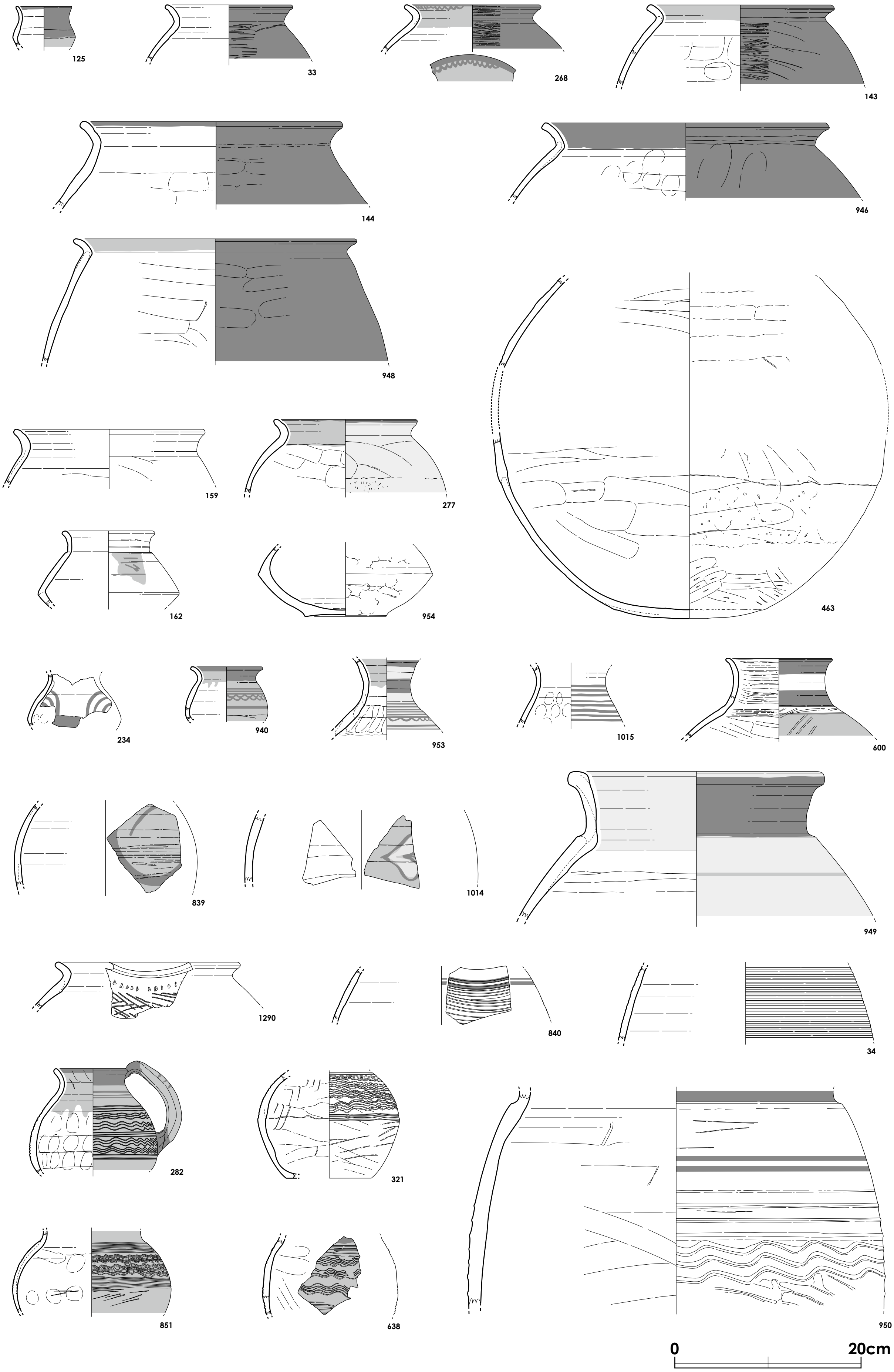


Figure 4.1   Representative specimens of Red ware Pot

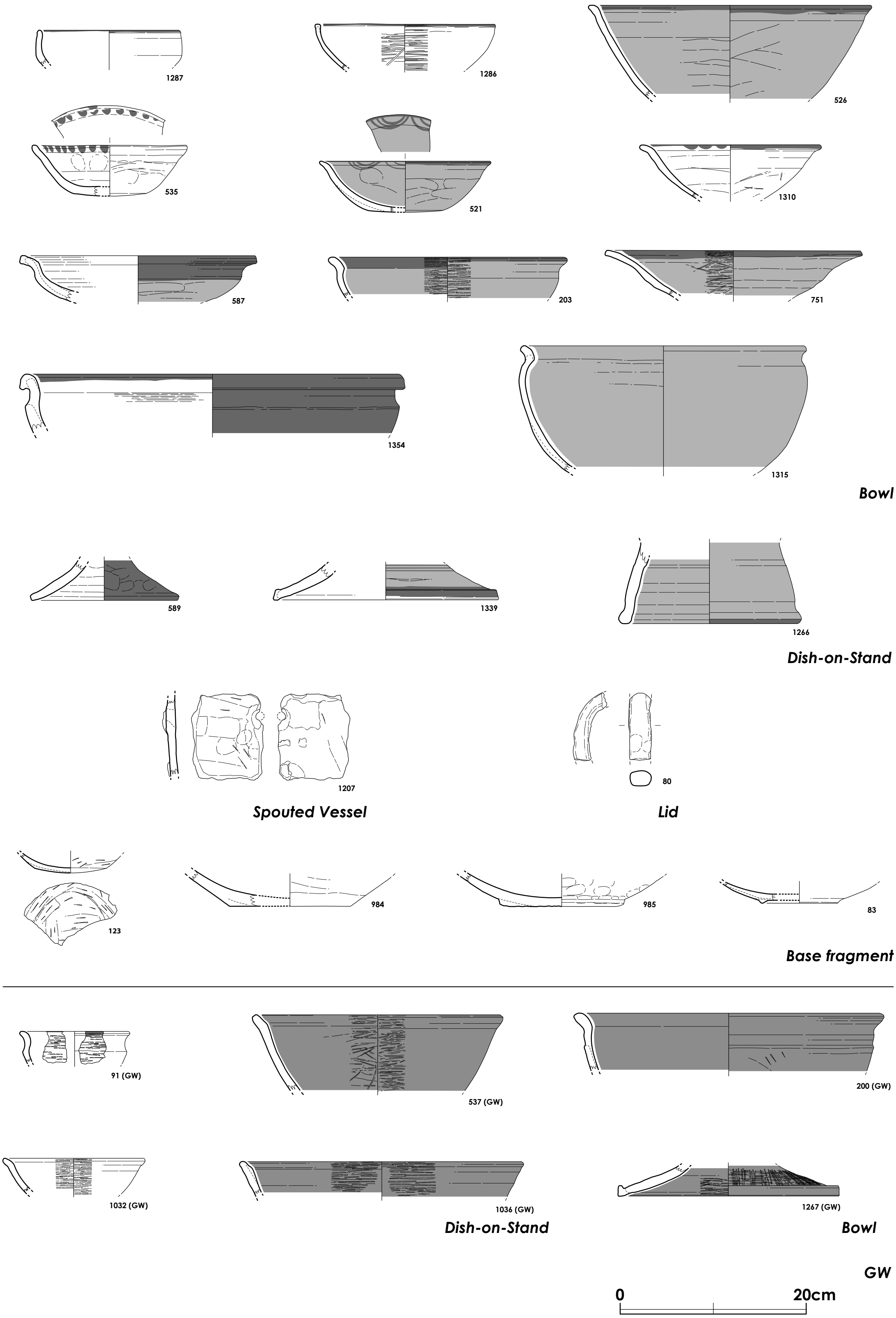


Figure 4.2 Representative specimens of Red ware Bowl, Dish-on-Stand, Spouted Vessel, Handle and Grey ware

2.2 Pots

(Figures 4.3 - 4.1-, Tables 4.3 - 4.8)

Pots include various formal features. With regards to those with their rim-neck portions intact, they are analyzed based on rim diameter (RD), rim-neck tallness, the outcurveness of the neck and rim shapes.

[Size and formal features]

Those with the rim portion intact (328 specimens in number) range from 4.0 cm to 50.0 cm in RD. They are shown in 5 cm classes in Table 4.3. The most number of specimens occur in Classes 3 and 4, followed by Classes 2 and 5. Those of Class 8 onwards are very limited in number. In this sense, the Pots are dominated by smaller sizes as far as the RD is concerned.

Those that are intact with the rim and neck count 300 specimens in number. The NH (neck height)/RD index shows a range of 0.02 to 0.47. Table 4.4 shows their distribution in classes, exhibiting a dominance of Classes 1 and 2. This indicates that short necks are popular in the Pots, though there are a certain number of specimens belong to Classes 3 - 5 or taller neck.

Table 4.5 shows the distribution of MRD (max rim diameter)/ND (neck diameter) in classes.

Rim shapes can be classified into the following types (Figure 4.3).

Type 1 Those having a simple rounded rim. This includes those have a shallow ridge on the external side.

Type 2 Those having a thickened rim projecting outwards.

Type 3 Those having aving a rim with a rectangular section having a shallow groove.

Type 4 Those having a projecting rim with a rectangular section.

In regards to body shapes (Figure 4.3), there is a great deal of variation, although it is difficult to see the relationships between rim-neck, body sherds and bases due to bad preservation. The most frequent shape is globular or elliptical body with a lower centre of gravity. Among other shapes, such as specimen nos. 234, 162, 125 and 954, a carination or a ridge is observed on the body. Especially in no. 954, which shows a flat biconical shape with a sharp carination. No. 162 with a rim has a ledge at the juncture between the neck and the body. Nos. 940 and 282 show an elliptical body with no carination. No. 1011 exhibits a squat globular body. No. 463 has a globular body with a round base. No. 1342 is also an example of a globular body. No. 321 is distinguished by a globular body with a large flat base. No. 286 has a globular body and a disc base. No. 175 represents a pear-shaped body of an elongated profile. No. 1114 has a squat globular body.

Classification of decoration technique

As mentioned above, Red ware can be classified into painted specimens and unpainted ones. Among unpainted ones, there are a fair number of specimens that have decorations. The decoration technique is classified into the following types (Figure 4.4, Table 4.5).

Technique 1 Painting.

Technique 2 Incised lines and dots.

Technique 3 Parallel grooves, straight and wavy.

Technique 4 Reserved slip technique.

Painted pottery

Painted pottery (625 specimens in total) can be further classified into monochrome paintings or black-on-red paintings (591 specimens) and polychrome paintings or black and white paintings on red (34 specimens). It is to be noted that the former type includes those that are applied with a white slip in addition to a red slip. In these specimens, black bands are executed on the white-slipped surface creating a polychrome appearance.

[Paintings on the rim-neck portion]

The paintings on rim-neck portions are

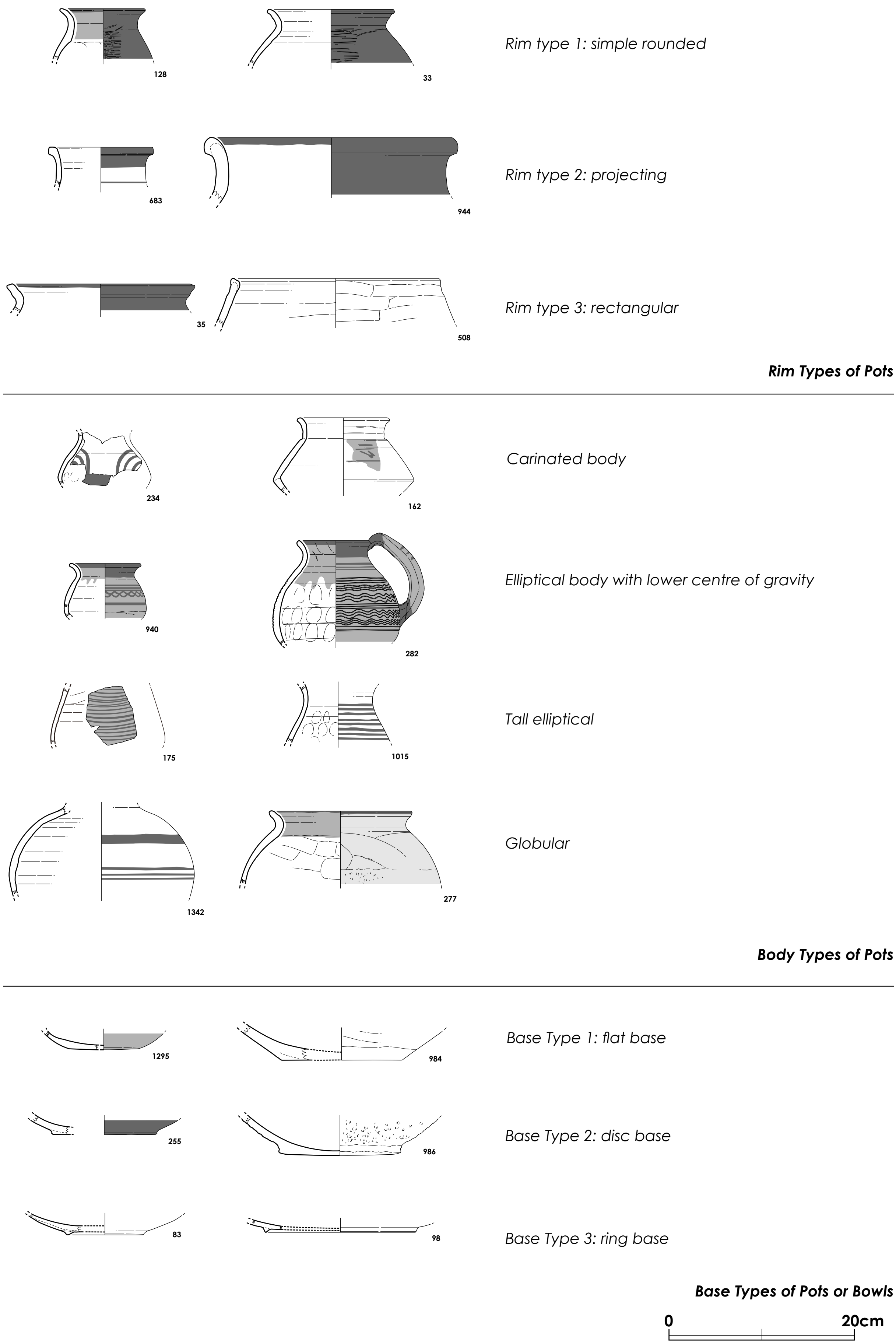


Figure 4.3 Formal classifications of the Red ware Pots

Table 4.3 Number of specimens of Red ware Pot Types and RD Classes

	Pot				RD Class										
	S. no.	**Type 1**	**Type 2**	**Type 3**	**S. no.**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Pit 1	14	12	2	0	14	0	1	8	3	0	1	1	0	0	0
Pit 5	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0
Pit 6	3	2	1	0	3	0	0	1	2	0	0	0	0	0	0
Pit 7A	3	3	0	0	3	0	0	1	2	0	0	0	0	0	0
Pit 8	4	3	1	0	4	0	1	2	1	0	0	0	0	0	0
Pit 8A	2	2	0	0	2	0	0	1	0	1	0	0	0	0	0
Pit 10	6	5	1	0	6	0	2	1	2	1	0	0	0	0	0
Pit 11	37	37	0	0	37	0	11	7	13	1	4	1	0	0	0
Pit 13	11	10	1	0	11	0	1	4	4	0	1	1	0	0	0
Pit 14	24	22	2	0	23	0	2	16	4	1	0	0	0	0	0
Pit 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 16	10	10	0	0	10	0	2	6	2	0	0	0	0	0	0
Pit 18	14	14	0	0	14	0	2	6	6	0	0	0	0	0	0
Pit 19	2	2	0	0	2	0	0	1	1	0	0	0	0	0	0
Pit 20	9	7	0	2	9	0	4	4	0	1	0	0	0	0	0
Pit 20A	2	2	0	0	2	0	0	1	0	1	0	0	0	0	0
Pit 21	13	13	0	0	13	0	1	6	4	1	1	0	0	0	0
Pit 22	4	3	0	0	4	0	1	3	0	0	0	0	0	0	0
Pit 23	9	8	1	0	9	0	2	4	2	1	0	0	0	0	0
Pit 25	3	3	0	0	3	0	0	1	0	0	0	2	0	0	0
Pit 26	17	11	6	0	16	0	3	8	3	1	1	0	0	0	0
Pit 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 27A	7	6	1	0	7	0	0	3	3	1	0	0	0	0	0
Pit 28	2	2	0	0	2	0	0	1	1	0	0	0	0	0	0
Pit 32	2	2	0	0	2	0	1	1	0	0	0	0	0	0	0
Pit 33	2	2	0	0	2	0	0	0	0	1	1	0	0	0	0
Pit 33A	7	6	0	1	7	0	1	4	1	1	0	0	0	0	0
Pit 33B	2	2	0	0	2	0	0	1	1	0	0	0	0	0	0
Pit 34	16	14	1	1	16	0	0	4	9	2	1	0	0	0	0
Pit 35	17	17	0	0	17	0	1	10	4	2	0	0	0	0	0
Pit 36	17	14	3	0	17	0	2	3	2	3	7	0	0	0	0
Pit 38	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0
Pit 38A	13	12	0	1	13	0	5	3	4	0	1	0	0	0	0
Pit 39	2	1	1	0	2	0	0	0	1	1	0	0	0	0	0
Pit 40	8	4	2	2	8	0	0	5	0	2	0	0	0	0	1
Pit 43	7	7	0	0	7	0	0	2	0	2	1	2	0	0	0
Pit 44	2	2	0	0	2	0	0	0	2	0	0	0	0	0	0
Pit 46	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0
Pit 49	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0
Pit 50	8	7	1	0	8	0	1	3	3	1	0	0	0	0	0
Pit 100	8	4	4	0	8	0	0	5	1	2	0	0	0	0	0
Trench 13	3	3	0	0	3	0	0	1	2	0	0	0	0	0	0
Trench 19	16	16	0	0	16	1	0	6	8	1	0	0	0	0	0
Trench 31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trench 37	4	3	1	0	4	0	0	2	2	0	0	0	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	334	297	29	7	332	1	44	137	95	28	19	7	0	0	1

Table 4.4 Number of specimens of Red ware Pot NH/RD Classes and MRD/ND Classes

	NH/RD Class						MRD/ND Class							
	S. no.	1	2	3	4	5	S. no.	1	2	3	4	5	6	7
Pit 1	12	6	6	0	0	0	14	0	6	6	2	0	0	0
Pit 5	1	0	1	0	0	0	1	0	0	1	0	0	0	0
Pit 6	3	0	3	0	0	0	3	0	3	0	0	0	0	0
Pit 7A	2	0	2	0	0	0	3	0	2	1	0	0	0	0
Pit 8	4	0	2	1	1	0	4	0	1	2	1	0	0	0
Pit 8A	2	0	2	0	0	0	2	0	1	1	0	0	0	0
Pit 10	6	4	1	0	1	0	6	0	5	0	1	0	0	0
Pit 11	36	13	13	4	4	2	37	0	23	7	6	1	0	0
Pit 13	11	5	4	0	2	0	11	1	6	2	1	1	0	0
Pit 14	23	9	13	1	0	0	23	1	10	12	0	0	0	0
Pit 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 16	10	5	4	0	1	0	10	0	8	2	0	0	0	0
Pit 18	14	6	5	2	1	0	14	0	7	6	1	0	0	0
Pit 19	2	0	2	0	0	0	2	0	1	1	0	0	0	0
Pit 20	9	1	3	1	3	0	9	1	2	5	1	0	0	0
Pit 20A	2	1	1	0	0	0	2	0	2	0	0	0	0	0
Pit 21	13	3	10	0	0	0	13	0	9	4	0	0	0	0
Pit 22	4	0	3	0	0	1	4	0	2	2	0	0	0	0
Pit 23	9	2	6	0	1	0	9	1	2	5	1	0	0	0
Pit 25	2	1	1	0	0	0	3	0	3	0	0	0	0	0
Pit 26	10	2	7	0	1	0	16	0	5	9	1	1	0	0
Pit 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 27A	5	2	2	0	1	0	7	0	6	0	1	0	0	0
Pit 28	1	1	0	0	0	0	2	0	1	1	0	0	0	0
Pit 32	2	0	1	1	0	0	2	0	0	1	0	1	0	0
Pit 33	2	2	0	0	0	0	2	0	2	0	0	0	0	0
Pit 33A	4	1	3	0	0	0	7	1	1	3	1	0	1	0
Pit 33B	2	0	2	0	0	0	2	0	0	2	0	0	0	0
Pit 34	14	6	7	0	1	0	16	0	7	8	0	0	0	1
Pit 35	16	2	13	0	0	0	17	0	6	7	4	0	0	0
Pit 36	17	9	6	2	0	0	17	2	8	4	3	0	0	0
Pit 38	1	0	1	0	0	0	1	0	0	1	0	0	0	0
Pit 38A	11	2	5	3	1	0	13	1	5	6	1	0	0	0
Pit 39	0	0	0	0	0	0	2	0	2	0	0	0	0	0
Pit 40	8	2	4	1	1	0	8	1	4	2	0	1	0	0
Pit 43	7	5	2	0	0	0	7	0	5	2	0	0	0	0
Pit 44	2	0	2	0	0	0	2	0	0	2	0	0	0	0
Pit 46	1	0	1	0	0	0	1	0	1	0	0	0	0	0
Pit 49	0	0	0	0	0	0	1	0	0	1	0	0	0	0
Pit 50	7	2	4	0	1	0	7	0	2	4	1	0	0	0
Pit 100	5	3	2	0	0	0	8	1	3	3	0	1	0	0
Trench 13	3	1	2	0	0	0	3	0	2	1	0	0	0	0
Trench 19	15	7	6	1	1	0	16	0	10	3	2	1	0	0
Trench 31	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trench 37	3	0	3	0	0	0	2	0	2	0	2	0	0	0
uncertain	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	301	103	155	17	21	3	331	10	165	117	30	7	1	1



Black or chocolate painting



Black on white painting



Polychrome painting



Incise technique



Parallel grooves (Pattern 1)



Parallel grooves (Pattern 2)



Parallel grooves (Pattern 3)



Reserved slip technique

Figure 4.4 Decorative techniques

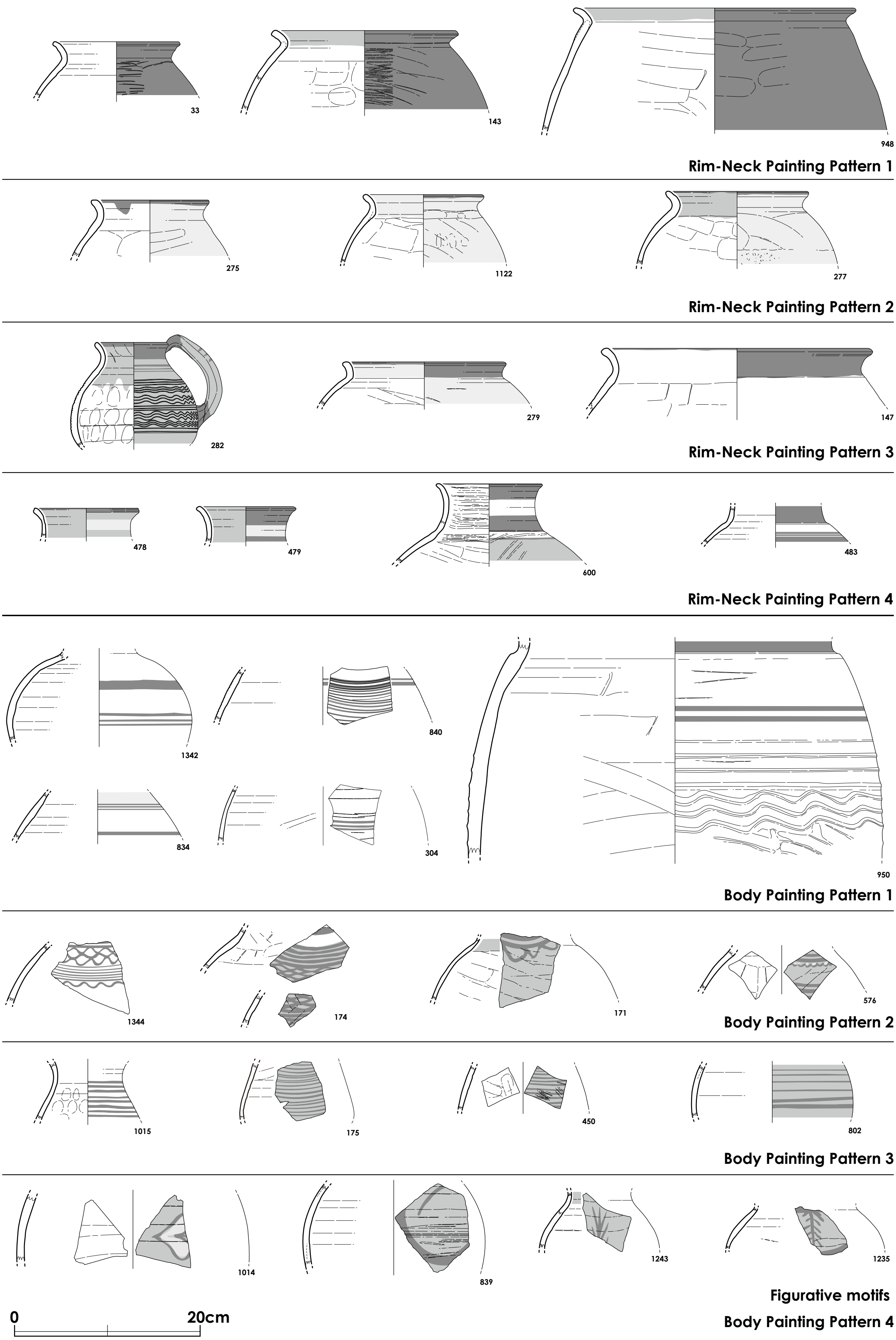


Figure 4.5 Painting Pattern on the Red ware Pots

Table 4.5 Number of specimens in decoration techniques and patterns of the Red ware Pot

							Neck Painting pattern						**Body Painting**									
													Figurative					**Band Pattern**				
Pit No.	**Total**	**Painted**	**Plain**	**Mono-chrome**	**Poly-chrome**	**White slip**	**Total**	**1**	**2**	**3**	**4**	**5**	**Total**	**Pipal**	**Horn**	**Plant**	**Unknown**	**Total**	**1**	**2**	**3**	**4**
Pit 1	868	624	244	594	30	19	330	195	87	37	10	1	9	1	3	4	1	171	103	47	7	14
Pit 5	24	20	4	20	0	0	13	12	0	0	0	1	1	0	0	1	0	5	2	1	0	2
Pit 6	2	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 7A	3	3	0	3	0	0	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 8	7	6	1	6	0	0	3	2	1	0	0	0	0	0	0	0	0	3	2	1	0	0
Pit 8A	18	12	6	10	2	1	4	2	0	2	0	0	1	0	0	0	1	6	3	2	0	1
Pit 10	4	3	1	3	0	0	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 11	17	13	4	12	1	1	7	5	1	1	0	0	0	0	0	0	0	2	2	0	0	0
Pit 13	58	47	11	46	1	0	26	17	4	4	1	0	0	0	0	0	0	13	3	8	1	1
Pit 14	25	15	10	12	3	0	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 15	80	48	32	48	0	1	31	21	6	4	0	0	0	0	0	0	0	15	12	3	0	0
Pit 16	5	2	3	2	0	0	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Pit 18	26	14	12	14	0	0	11	5	6	0	0	0	0	0	0	0	0	3	1	1	0	1
Pit 19	27	20	7	19	1	0	15	6	7	2	0	0	0	0	0	0	0	4	2	1	1	0
Pit 20	3	2	1	2	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 20A	35	20	15	20	0	0	11	2	5	2	2	0	0	0	0	0	0	8	4	3	0	1
Pit 21	3	3	0	3	0	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0
Pit 22	30	21	9	18	3	0	10	7	3	0	0	0	0	0	0	0	0	4	2	2	0	0
Pit 23	10	6	4	6	0	0	6	2	2	1	1	0	0	0	0	0	0	2	1	1	0	0
Pit 25	34	26	8	24	2	0	11	8	2	1	0	0	0	0	0	0	0	6	4	0	1	1
Pit 26	5	4	1	4	0	0	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Pit 27	36	29	7	28	1	0	13	7	5	0	1	0	0	0	0	0	0	5	5	0	0	0
Pit 27A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 28	10	7	3	7	0	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0
Pit 32	6	4	2	4	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 33	4	3	1	3	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 33A	7	3	4	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 33B	20	18	2	13	5	0	5	3	1	1	0	0	0	0	0	0	0	4	1	2	0	1
Pit 34	5	5	0	5	0	0	2	2	0	0	0	0	0	0	0	0	0	2	0	1	1	0
Pit 35	53	41	12	40	1	5	22	15	5	1	1	0	1	0	1	0	0	14	13	1	0	0
Pit 36	43	33	10	33	0	2	21	10	7	3	1	0	0	0	0	0	0	9	8	1	0	0
Pit 38	43	28	15	28	0	4	18	12	0	5	1	0	0	0	0	0	0	13	11	2	0	0
Pit 38A	9	7	2	6	1	1	2	2	0	0	0	0	0	0	0	0	0	3	2	1	0	0
Pit 39	33	26	7	24	2	1	12	7	4	0	1	0	1	1	0	0	0	10	4	5	1	0
Pit 40	7	3	4	3	0	0	2	0	1	1	0	0	0	0	0	0	0	1	0	1	0	0
Pit 43	36	28	8	28	0	1	11	10	0	1	0	0	2	0	2	0	0	4	4	0	0	0
Pit 44	10	9	1	9	0	0	7	2	4	1	0	0	0	0	0	0	0	1	1	0	0	0
Pit 46	24	15	9	15	0	0	8	8	0	0	0	0	0	0	0	0	0	4	3	1	0	0
Pit 49	4	2	2	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Pit 50	1	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 100	11	10	1	9	1	0	6	1	5	0	0	0	0	0	0	0	0	1	0	1	0	0
Trench 13	41	29	12	29	0	1	8	4	1	3	0	0	3	0	0	3	0	14	9	1	1	3
Trench 19	9	7	2	7	0	0	2	1	0	1	0	0	0	0	0	0	0	4	0	3	1	0
Trench 31	29	20	9	16	4	0	11	3	8	0	0	0	0	0	0	0	0	4	1	2	0	1
Trench 37	3	3	0	3	0	0	1	0	0	1	0	0	0	0	0	0	0	3	1	2	0	0
uncertain	8	7	1	6	1	0	5	3	1	1	0	0	0	0	0	0	0	1	0	0	0	1
Total	868	624	244	594	30	19	330	195	87	37	10	1	9	1	3	4	1	171	103	47	7	14

Table 4.6 Number of specimens in decoration techniques and patterns of the Red ware Pot

	Parallel Groove Types				***Incised pattern***	***Slurry***	***Manufacturing technique***				***Post-firing graffiti***
	Total	***1***	***2***	***3***			***Total***	***1***	***2***	***3***	
Pit 1	2	2	0	0	1	1	14	11	3	2	0
Pit 5	1	1	0	0	0	0	2	1	1	1	0
Pit 6	0	0	0	0	0	0	2	2	0	0	0
Pit 7A	0	0	0	0	0	0	4	3	1	0	0
Pit 8	6	4	2	0	0	0	15	9	6	1	0
Pit 8A	1	0	1	0	0	0	3	3	0	0	1
Pit 10	1	1	0	0	0	2	14	11	3	0	1
Pit 11	0	0	0	0	2	3	56	53	3	6	0
Pit 13	0	0	0	0	4	0	21	20	1	1	1
Pit 14	20	12	7	1	1	8	70	49	21	9	5
Pit 15	0	0	0	0	0	1	5	5	0	1	0
Pit 16	0	0	0	0	2	5	23	21	2	2	1
Pit 18	0	0	0	0	0	4	26	23	3	1	0
Pit 19	1	0	0	1	0	0	1	0	1	0	0
Pit 20	3	1	2	0	2	5	28	20	8	1	0
Pit 20A	0	0	0	0	0	0	1	1	0	0	0
Pit 21	1	1	0	0	0	0	22	18	4	0	0
Pit 22	0	0	0	0	1	3	9	9	0	0	0
Pit 23	6	2	4	0	0	2	30	23	7	1	0
Pit 25	0	0	0	0	0	0	2	2	0	0	1
Pit 26	8	5	3	0	1	3	25	15	10	2	0
Pit 27	0	0	0	0	0	0	0	0	0	0	0
Pit 27A	0	0	0	0	0	0	3	2	1	1	0
Pit 28	0	0	0	0	0	0	4	4	0	0	0
Pit 32	0	0	0	0	1	0	2	1	1	0	0
Pit 33	4	3	1	0	0	0	6	2	4	0	1
Pit 33A	2	0	2	0	0	1	14	12	2	0	0
Pit 33B	0	0	0	0	0	0	3	2	1	1	0
Pit 34	13	11	2	0	1	1	42	17	25	1	0
Pit 35	7	6	1	0	0	2	32	18	14	6	0
Pit 36	4	1	0	3	0	4	40	32	8	1	4
Pit 38	3	3	0	0	0	1	8	3	5	0	0
Pit 38A	6	5	1	0	0	1	24	15	9	2	0
Pit 39	2	1	0	1	0	0	6	2	4	1	0
Pit 40	6	5	1	0	0	5	34	25	9	1	3
Pit 43	0	0	0	0	2	0	7	6	1	0	0
Pit 44	1	1	0	0	1	2	22	19	3	0	1
Pit 46	1	0	1	0	1	0	4	3	1	0	0
Pit 49	0	0	0	0	0	0	0	0	0	0	0
Pit 50	0	0	0	0	0	0	6	5	1	1	0
Pit 100	12	7	5	0	1	2	34	19	15	2	1
Trench 13	1	1	0	0	2	0	8	7	1	1	0
Trench 19	2	1	1	0	1	0	25	25	0	2	0
Trench 31	0	0	0	0	0	0	3	2	1	0	0
Trench 37	1	1	0	0	1	0	4	3	1	1	1
uncertain	0	0	0	0	0	0	0	0	0	0	0
Total	115	75	34	6	25	56	704	523	181	49	21

distinguished by horizontal bands (Figure 4.5). There is no specimen that exhibits other motifs on the rim-neck portion, except for adjoining semicircles, circles and loops on the internal side of the rim. The band pattern on the rim-neck portion can be classified into the following patterns.

Pattern 1 A wide band covering not only the rim-neck portion but also a wide area of the body.
Pattern 2 A narrow band covering only the rim portion.
Pattern 3 A medium band covering the neck portion.
Pattern 4 Multiple bands covering the rim-neck portion, interspersed by surface colour or slip colour in bands.

Pattern 1 is distinguished by a wide band covering a large area of vessels. In some specimens, the band is painted from the rim to the middle of the body and in others it reaches down to the lower part of the body near the base. In those with only the rim portion is intact, it is difficult to determine whether they belong to Type 1 or Type 3. Therefore, they were not counted. 125 specimens belong to this type.

Pattern 2 is defined by a narrow band painted on the rim. The neck portions are not painted. 47 specimens are included in this type.

In Pattern 3, a band covers the rim and the upper part of the body, or the entire rim-neck portion. 31 specimens have been identified as belonging to this type.

In Pattern 4, one band covers the rim and upper part of the neck and another band is painted on the lower part of the neck. The space between the two is left unpainted so as to create banded pattern on the neck. It seems likely that the banded pattern continues to the shoulder portion based on some body fragments. Only three specimens are identified as this type, although some specimens in Pattern 3 may have belong to this type.

As mentioned above, 15 specimens are painted

Table 4.7 Relations between Rim types and decoration patterns in the Red ware Pots

		Rim Type		
		1	**2**	**3**
Decoration	**Neck Band 1**	120	3	3
	Neck Band 2	83	4	0
	Neck Band 3	14	6	0
	Neck Band 4	5	2	1
	Body Band 1	3	2	0
	Body Band 2	4	0	0
	Body Band 3	0	0	0
	Body Band 4	0	0	0
	Bichrome	1	0	0
	Incised	1	0	0
	Groove 1	0	0	0
	Groove 2	0	0	0
	Groove 3	0	0	0
	Plain	52	5	3

Table 4.8 Relations between manufaturing techniques and decoration patterns in the Red ware Pots

		Manufacturing technique	
		1	**2**
Decoration	**Neck Band 1**	132	5
	Neck Band 2	51	0
	Neck Band 3	22	10
	Neck Band 4	3	1
	Body Band 1	35	66
	Body Band 2	34	13
	Body Band 3	5	2
	Body Band 4	12	2
	Bichrome	21	8
	Incised	25	0
	Groove 1	8	67
	Groove 2	27	6
	Groove 3	3	3

with adjoining semicircles, circles and loops on the internal side of the rim. In all specimens, those motifs are placed hanging on the rim band. Most specimens exhibit several in a set, probably arranged at intervals. In no. 268, thirteen intersecting small loops are adjoiningly arranged. Loops are arranged intersecting with each other.

[Paintings on the body]

Paintings on the body appear only in those with the rim-neck painting Pattern 1. They are composed of geometric and figurative motifs. The geometric motifs

consist of horizontal parallel bands, wavy, concentric semicircles, hatched triangles and other indeterminate motifs. Figurative motifs include a horn-like motif and plant motifs. In addition, a few specimens show a wavy stroke flanked by a pair of oblique strokes.

- Parallel bands

Horizontal bands are a dominant motif painted on the body. Their arrangements can be classified into the following patterns.

Pattern 1 Multiple horizontal parallel bands, accompanied with no other motifs.
Pattern 2 Multiple horizontal parallel bands, accompanied with wavy band(s).
Pattern 3 Horizontal parallel bands covering a wide area of body.
Pattern 4 Horizontal parallel bands demarcating a horizontal register, in which other motifs are placed.

In Pattern 1, some specimens exhibit only one band that is wider than the case of multiple bands, which are narrower. In some specimens, several sets of parallel bands are placed at intervals.

In Pattern 2, (a) wavy band (s) accompany parallel bands in some specimens. Only one specimen (212) shows a wavy band with no parallel bands.

- Concentric semicircles.

In three specimens, concentric semicircles are painted on the body over a horizontal band. Two (nos. 234, 399) of them are small pots having a carination on the body. In another specimen (no. 18), the motif is accompanied with rows of incised dots,

- Hatched triangles

One specimen exhibits double hatched triangles that are placed in inverted directions, in a horizontal band demarcated by parallel bands.

- Horn-like motif

A horn-like motif was identified on three specimens (nos. 1076, 1085, 839). However, it is difficult to identify this motif in small fragments, as it is depicted by a large curvilinear band. One specimen (no. 839) shows a curvilinear band with one end.

- Plant motif

The plant motif is found on five specimens (nos. 1243, 1244, 1235, 20, 777). It is painted in a horizontal register demarcated by parallel bands. On four specimens, it is represented by a central axis and short parallel projections on both side. On one specimen, a multi-branched plant is painted laterally.

In addition to the specimens with the motifs described above, some sherds exhibit a part of some large motifs that simply cannot be identified on small fragments.

- Polychrome paintings

Thirty-four specimens have polychrome paintings. They are painted with black and white pigments. As the motifs depicted are large in size on a wide area of the body, the entire shapes of motifs are uncertain in small fragments.

No. 235 exhibits a motif consisting of a lenticular shape delineated by black strokes that are filled with a white pigment and curvilinear black strokes. It may represent a floral motif. Nos. 1014 is a pipal leaf which is laterally placed. It is drawn by black strokes and filled by a white pigment. No. 692 with parallel grooves is painted with a pair of opposite lenticular strokes bridged by a set of four parallel strokes and filled by a white pigment. It may be comparable with a pentagonal motif in a specimen from the site of Kunal. The paintings on no. 63 consist of parallel horizontal bands and dots in black overlapped by a white circle.

In nos. 152 and 700, an outline of a lenticular shape and parallel strokes in black are painted and then filled with a white pigment. Nos. 1332 and 779

have a similar motif. On no. 1200, lenticular white strokes are painted with a black outline which is gently curved. Nos. 574 and 778 may represent a similar motif. On nos. 1304, 236, 62, 629, 632, 577, 111, 844, 783 and 451, a white pigment fills the inside of black outlines. On no. 1180, some indeterminate motifs are painted in black and white below parallel black bands on a white-slipped surface. No. 775 exhibits a pattern of parallel bands and wavy bands, among which one wavy band is painted in white. No. 995 has parallel grooves and a white painting of uncertain shape is painted over black-painted surface. Nos. 576 and 1017 show a pattern of parallel bands and a wavy band, on which white dots are added.

Relations between the rim types and painting patterns

On rim sherds, Rim Type 1 is dominant in all patterns (Table 4.7). It is most commonly seen in the unpainted pottery. It may be noted that the Rim Type 2 occurs on all of the rim-neck patterns, though limited in numbers. Three specimens of Rim Type 3 belong to the Pattern 1 and one specimen to the Pattern 3.

In those with their rim-neck portion and the body portion intact, which are limited in number, the Rim Type 1 occurs in Patterns 1 and 2 and the Rim Type 2 is seen in the Pattern 1. There is no specimen with the rim-neck portions intact among the polychrome painted potsherds.

Manufacturing technique

In terms of manufacturing technique, those finished by both rotational and non-rotational technique number 357 specimens and those represented only by rotational technique number 130 specimens. Among the former, 41 specimens were finished by streak burnishing (Figure 4.9).

The excavations yielded a number of body sherds that had a luted edge exposed in the broken portion (Figures 4.6 - 4.8). These examples clearly suggest that the primary modelling was conducted using luting techniques in the case of those that were finished by the non-rotational technique.

Table 4.8 shows the relations between painting patterns and manufacturing technique. In the rim-neck painting pattern, those finished by both rotational and non-rotational techniques outnumber those finished only by the rotational technique in all the painting patterns, although there are a number of specimens that are intact only with their rim-neck portion and the upper part of the body making it difficult to see the relations in manufacturing technique between the rim-neck portion and the entire body portion in manufacturing technique. In Pattern 3, the number of those finished only by the rotational technique is larger than others.

For the body fragments, it is noteworthy that those made only by the rotational technique outnumber those made by both the rotational and non-rotational techniques, whereas in Patterns 2 to 4, the latter dominates in number. For the polychrome pottery, those made by both rotational and non-rotational techniques are larger in number.

Incised pottery

On 25 specimens, incised decorations are evident. They consists of incised lines and dots (Figure 4.10). One specimen is intact with the rim-neck portion, while the rest are fragments. On the rim specimen (no. 1290), a row of incised dots is executed around the neck and incised lines arranged in a vertical zigzag pattern on the body. In two specimens (nos. 242, 183), a notched appliqué band is applied around the body and incised lines in a vertical zigzag pattern whether above the band or below the band. Nos. 708 and 855 exhibit two rows of incised dots arranged below vertical zigzag pattern of incised lines. No. 18 is executed by incised dots in addition to a painted horizontal band and concentric semicircles.

On no. 1127, rows of incised dots and hatched triangles of incised lines accompany with V-shaped black bands and a horizontal band. On no. 1128, vertical and lateral incised lines are executed with a black band, although its entire pattern is uncertain.



Traces of luting and non-rotationalsmoothing technique



Luted edge exposed on the broken portion

Figure 4.6 Luting technique



Luted edge exposed on the broken portion

Figure 4.7 Luting technique



Luted edge exposed on the broken portion

Figure 4.8 Luting technique



Figure 4.9   Burnishing technique

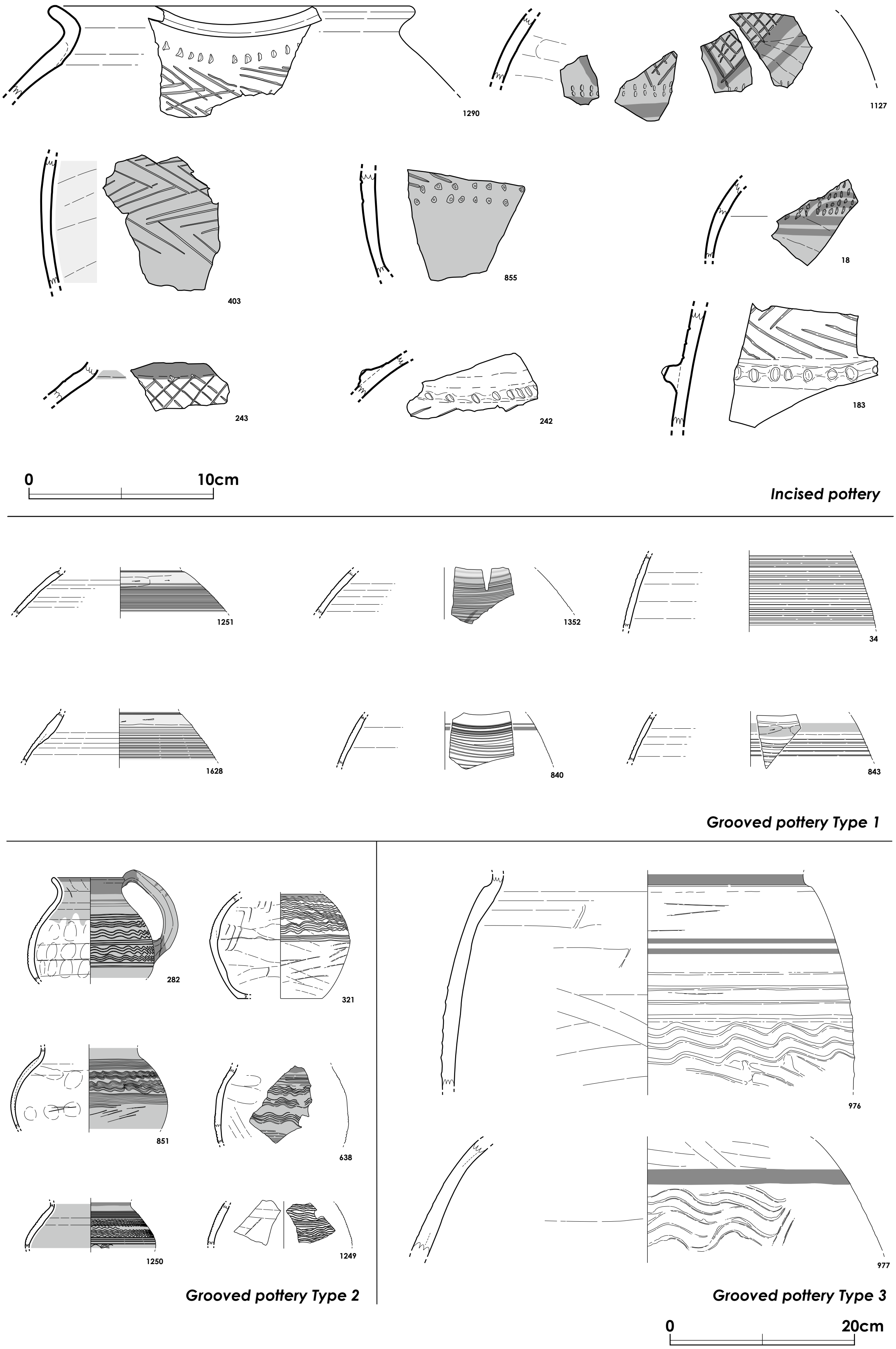


Figure 4.10 Representative types of the Incised and Grooved pottery

Table 4.9 Relations between Neck Types and Body Types of the Red ware Bowl

		Neck			
		1	2	3	4
Body	1	49	30	2	43
	2	6	41	8	4
	3	6	20	3	5

On no. 605, a part of two rows of incised dots are intact. On no. 243, oblique incised lines are executed. On no. 244 is incised with oblique lines in irregular directions. On no. 1293, a part of the oblique lines are curved. Other specimens are all incised with a vertical zigzag pattern.

Although nos. 515 - 519 are not counted as the Incised pottery because of their small size, these sherds are executed with incised grooves of irregular shapes. These specimens appears to belong to one sigle vessel.

In terms of manufacturing technique, all specimens of incised pottery are finished by smoothing without rotation.

Grooved pottery

115 specimens are incised with parallel grooves by comb-like instruments. They are classified into the following three types in terms of the pattern that they exhibit (Figure 4.10).

Type 1 Those with parallel horizontal grooves, relatively wide and shallow in each groove, with no gap on the external side of the body.

Type 2 Those with parallel horizontal and wavy grooves, with gaps between each stroke.

Type 3 Those with parallel grooves, either horizontal or wavy, wider in width in each groove.

[Type 1]

Seventy-five specimens are included in this type. No specimen is found having a rim-neck portion intact, though two specimens (nos. 1251, 1028) retain the juncture between the neck and the body having a ledge between the neck and the body. In these specimens, black bands are painted on the neck and the shoulder over a white-slipped surface and is executed with grooves below the shoulder. Nos. 300, 843, 840, 699, 1352, 322, 115, 641 and 847 are intact with the shoulder portion showing grooves below black bands on the shoulder. On nos. 115 and 1352, a white slip is executed before black bands. No. 917 may represent a sherd of a lower body near the base. No. 322 is exceptionally executed with wavy grooves in addition to the horizontal grooves.

The remaining specimens are fragments of the middle portion of the body. On nos. 330, 700, 702, 994, 846, 1254, 1256, 1023 and 1024, a horizontal black band is painted over the grooves. On nos. 1284, 1094, 1091, 329, 68, 1352, 698, 848, 844, 995 and 1026, a part of some curvilinear black bands are intact that may belong to some indeterminate motifs painted widely on the body.

In terms of shape, some better-preserved specimens (nos. 34, 993, 840, 843, 842 and 1028) indicate an elliptical body shape with a lower gravity.

Among the 75 Type 1 specimens, 67 are finished by smoothing with rotation. Although it is difficult to discuss the relationship of this combination of manufacturing techniques to the total vessel shape, it is distinctive when compared to those with the non-rotational techniques.

The features described above are distinctively similar to grooved jars seen among the Kot Diji pottery in the western Punjab, Gomal and Bannu regions. The manufacturing technique using rotation also indicates the close relations with the ceramic type in those regions.

[Type 2]

Thirty-four specimens were identified as Type 2. This type is distinguished by a combination of parallel horizontal grooves and wavy grooves. The width of each groove is narrower than that of Types 1 and 3. Except for one specimen (no. 282), all are body fragments that show globular (nos. 851, 321), oblong (no. 638), and elliptical (nos. 1250, 282) shapes. In

terms of pattern, two sets of horizontal grooves demarcate a wide space in the body, which is filled by several sets of wavy grooves. In no. 282, horizontal grooves and wavy grooves are alternately arranged.

There are specimens that exhibit paintings as well, i.e. medium band on the neck (nos. 638, 1250, 1027 and 282), a wide band covering a wide area of the body (nos. 697, 696), and parallel bands on the body (nos. 852, 784).

In terms of manufacturing technique, 27 specimens, including better-preserved ones, are finished by smoothing without rotation.

[Type 3]

This type is distinguished by grooves of wider width in each, which are arranged in horizontal and wavy bands. They are all regarded as belonging to large pots or jars. Six specimens are identified. No. 976 is a large fragment of the neck and body of a vessel, having a medium band on the neck and parallel bands on the shoulder. Below the black bands there are executed three parallel horizontal grooves and three wavy grooves. No. 977 is also a large fragment of the upper part of a vessel that has parallel bands on the shoulder and wavy grooves below the bands. The rest are intact only with wavy grooves.

In terms of manufacturing technique, three specimens are entirely finished by smoothing with rotation, and other three are by smoothing without rotation. On no. 976, the neck and shoulder portions are smoothened by rotation, while the body is finished by rotational smoothing. The use of the non-rotational technique may relate to their large size.

Reserved slip technique

In only one specimen, the reserved slip technique was ascertained (no. 695). Wavy bands are executed on a black band.

2.3 Bowls

(Figure 4.11, Table 4.9 - 4.11)

232 specimens of Bowls were identified. They show variations in shapes and sizes.

The Bowls range from 7.3 cm to 49.0 cm in RD. Table 4.11 exhibits the RD distributions in 5 cm classes, showing that they concentrate in fair number among Classes 3 to 8. Among those, Class 6 counts the largest number of vessels.

In classifying the formal features of Bowls, the relations between the neck form and the body form were used. The neck forms can be classified into the following types (Table 4.10).

Neck Type 1	Slightly out-curved.
Neck Type 2	Prominently out-curved.
Neck Type 3	Incurved.
Neck Type 4	Straight neck.

The body forms are classified into the following types.

Body Type 1	Hemispherical or shallow hemispherical body.
Body Type 2	Carinated or ridged body.
Body Type 3	Bulging body.

Based on the correlations between the Neck Types and the Body Types, 12 types are established (Table 4.9).

[Type 1]

Type 1, which is defined as having Neck Type 1 and Body Type 1, numbers 49 specimens. They measure 14.0 cm to 34.8 cm in RD. There are shallow and deep shapes. 24 specimens are painted with a narrow black band on the rim, 15 specimens are painted with adjoining semi-circles on the internal side of the rim and eight specimens are with loops on the internal side of the rim. All of the specimens are finished by both rotational and non-rotational

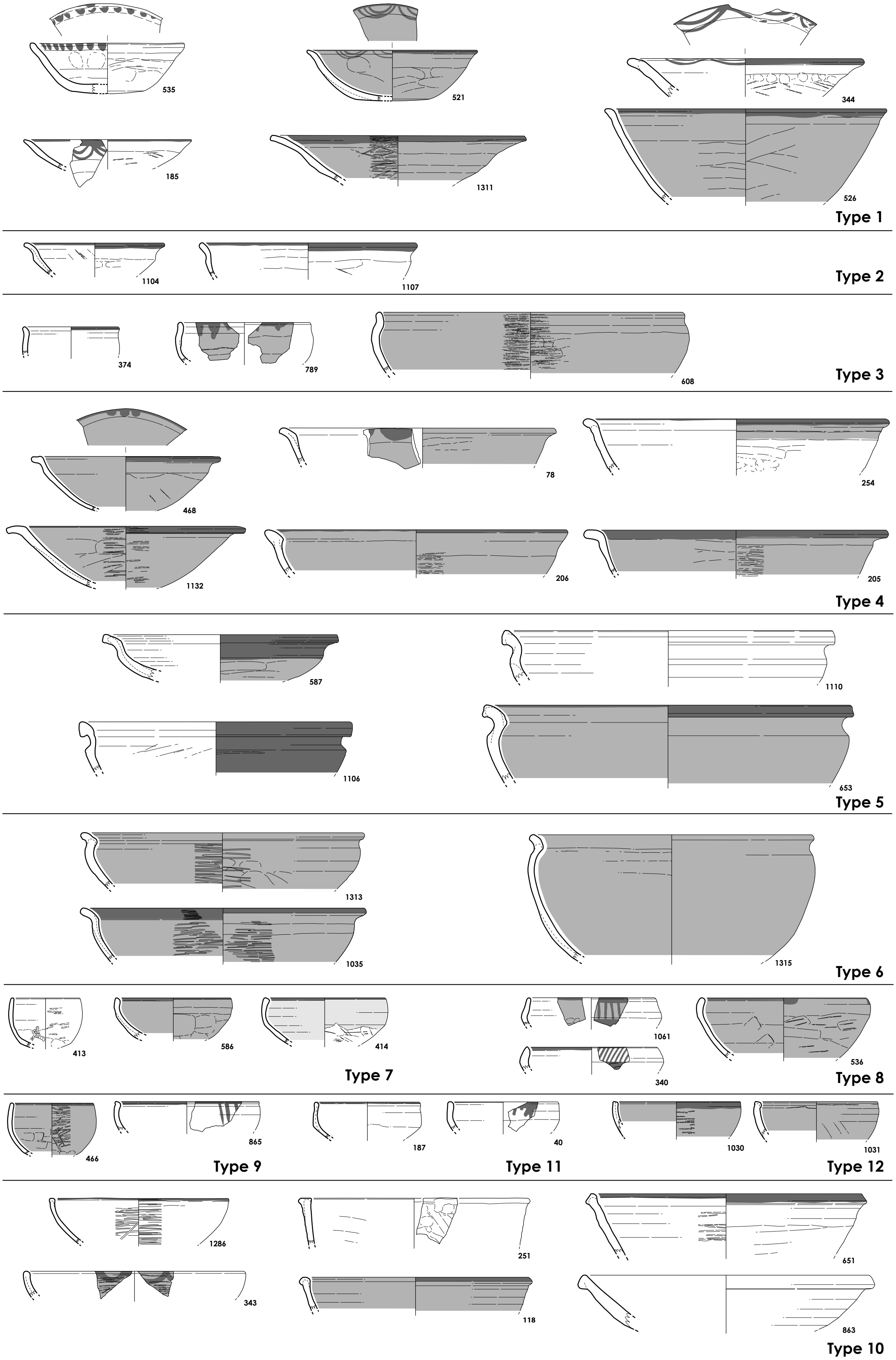


Figure 4.11 Representative types of the Red ware Bowls

techniques. Five specimens are finished by streak burnishing.

[Type 2]

Type 2, which is defined by Neck Type 1 and Body Type 2, numbers six specimens. They show a range of 14.8 cm to 28.0 cm in RD. As far as the intact portions are concerned, they show shallow shapes. Six specimens are painted with a narrow band on the rim, one specimen with adjoining semicircles on the internal side of the rim, and one specimen with loops on the internal side of the rim. All are finished using both rotational and non-rotational techniques.

[Type 3]

Type 3, which is defined by Neck Type 2 and Body Type 1, numbers 30 specimens. They measure 10.1 cm to 40.2 cm in RD. In general they show a deeper shape. Three specimens are painted with a narrow band on the rim, and one with adjoining semicircles on the internal side of the rim. Four specimens are finished using both rotational and non-rotational techniques, and two specimens are only by rotational techniques. Two specimens are streak burnished.

[Type 4]

Type 4, which is represented by Neck Type 2 and Body Type 1, numbers 30 specimens. They range from 17.8 cm to 38.3 cm in RD. There are both shallow and deep shapes. 23 specimens are painted with a narrow band on the rim, seven with adjoining semicircles on the internal side of the rim, and two with loops on the internal side of the rim. 26 specimens are finished using both rotational and non-rotational techniques and two rotational techniques. In two specimens, the technical features cannot be determined due to their small size. Seven specimens are streak burnished. One specimen has a slurry applied to the external side.

[Type 5]

Type 5, which is defined by Neck Type 2 and Body Type 2, numbers 41 specimens. These measure 13.4 cm to 49.0 cm in RD. There is a variation in the rim shapes. In terms of overall shapes, it appears that there are shallow and deep shapes. Twenty-four specimens are painted with a narrow band on the rim, three with adjoining semicircles on the internal side of the rim, and one with loops on the internal side of the rim. Thirty-eight specimens are finished using both rotational and non-rotational techniques, and two only by rotational techniques. One specimen is a rim-neck fragment that provides no clues as to its manufacturing technique Seven specimens are streak burnished. One specimen has a slurry applied to the external side.

[Type 6]

Type 6, which is represented by Neck Type 2 and Body Type 3 numbering 20 specimens. They show a range of 11.5 cm to 40.0 cm in RD. There are variations in the neck forms and body forms. Nos. 201, 722, 1313, 1314, 1315, 469, 231, 231 and 1041 exhibit a largely bulging body and a relatively shorter neck. Nos. 202, 765, 1035, 96, 735 and 1316 are less bulging on the body, having relatively long necks.

Twelve specimens are painted with a narrow band on the rim and three with adjoining semicircles on the internal side of the rim. All are finished by both rotational and non-rotational techniques and are streak-burnished.

[Type 7]

This type is represented by only four specimens that have Neck Type 3 and Body Type 1. They measure 7.3 cm to 24.0 cm in RD. Two specimens are painted with a narrow band on the rim. All are finished by both rotational and non-rotational techniques and only one is streak-burnished.

[Type 8]

This type, which is defined as having Neck Type 3 and Body Type 2, numbers six specimens. They show a carination or a ridge on the upper part of the body

Table 4.10 Distribution of the Red ware Bowl Types

	Bowl													
	Total	***Type 1***	***Type 2***	***Type 3***	***Type 4***	***Type 5***	***Type 6***	***Type 7***	***Type 8***	***Type 9***	***Type 10***	***Type 11***	***Type 12***	***uncertain***
Pit 1	3	1	0	0	0	1	1	0	0	0	0	0	0	0
Pit 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 7A	4	1	0	0	1	1	0	0	0	0	0	1	0	0
Pit 8	8	0	1	0	2	1	0	0	2	0	1	0	0	1
Pit 8A	6	2	0	0	0	1	1	0	0	0	1	0	1	0
Pit 10	6	2	0	0	1	0	0	0	0	0	3	0	0	0
Pit 11	27	4	0	1	3	5	2	1	0	0	10	1	0	0
Pit 13	9	2	0	0	2	0	2	0	0	0	3	0	0	0
Pit 14	15	4	0	1	5	3	0	0	1	0	1	0	0	0
Pit 15	8	0	0	1	1	3	0	0	0	0	3	0	0	0
Pit 16	11	2	0	0	2	0	2	2	0	0	3	0	0	0
Pit 18	5	0	0	0	2	0	1	0	1	1	0	0	0	0
Pit 19	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Pit 20	18	8	0	0	1	5	1	0	1	0	1	0	0	1
Pit 20A	2	0	0	0	0	1	1	0	0	0	0	0	0	0
Pit 21	3	0	0	0	1	1	0	1	0	0	0	0	0	0
Pit 22	1	0	0	1	0	0	0	0	0	0	0	0	0	0
Pit 23	8	1	0	0	0	2	0	0	0	0	5	0	0	0
Pit 25	2	0	0	0	0	0	2	0	0	0	0	0	0	0
Pit 26	6	3	0	0	0	2	0	0	0	0	0	0	1	0
Pit 27	1	0	0	0	0	0	1	0	0	0	0	0	0	0
Pit 27A	3	0	0	0	0	0	1	0	1	0	1	0	0	0
Pit 28	1	0	0	0	0	0	0	0	0	0	1	0	0	0
Pit 32	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Pit 33	4	1	0	1	0	1	1	0	0	0	0	0	0	0
Pit 33A	6	1	0	1	2	0	0	0	0	0	1	1	0	0
Pit 33B	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Pit 34	8	0	1	0	0	4	0	0	0	1	2	0	0	0
Pit 35	5	1	0	0	0	1	0	0	0	0	3	0	0	0
Pit 36	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 38	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Pit 38A	10	2	0	0	3	1	2	0	0	0	0	0	2	0
Pit 39	2	0	0	0	1	0	0	0	1	0	0	0	0	0
Pit 40	10	2	3	1	0	4	0	0	0	0	0	0	0	0
Pit 43	4	1	0	0	1	0	0	0	0	0	2	0	0	0
Pit 44	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 46	4	1	1	0	1	0	0	0	0	0	0	0	0	1
Pit 49	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pit 50	6	4	0	0	1	0	1	0	0	0	0	0	0	0
Pit 100	6	2	0	0	0	3	0	0	0	1	0	0	0	0
Trench 13	3	1	0	0	0	0	0	0	0	0	1	1	0	0
Trench 19	9	4	0	0	1	0	4	0	0	0	0	0	0	0
Trench 31	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trench 37	2	1	0	0	0	1	0	0	0	0	0	0	0	0
uncertain	1	0	0	0	0	0	0	0	0	0	1	0	0	0
Total	231	53	6	7	31	41	23	4	7	3	43	4	5	4

Table 4.11 Distribution of the Red ware Bowl RD Classes

		RD Class									
Pit. no	***S. no.***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***
Pit 1	***2***	0	0	0	1	0	0	0	1	0	0
Pit 5	***0***	0	0	0	0	0	0	0	0	0	0
Pit 6	***0***	0	0	0	0	0	0	0	0	0	0
Pit 7A	***3***	0	0	1	0	1	1	0	0	0	0
Pit 8	***5***	0	0	1	1	0	3	0	0	0	0
Pit 8A	***5***	0	1	0	2	1	0	0	1	0	0
Pit 10	***6***	0	0	0	2	2	2	0	0	0	0
Pit 11	***24***	0	0	1	6	8	3	5	1	0	0
Pit 13	***9***	0	1	1	1	2	0	3	1	0	0
Pit 14	***13***	0	0	1	0	4	3	2	2	1	0
Pit 15	***8***	0	1	0	1	1	2	2	1	0	0
Pit 16	***11***	0	1	1	2	1	4	0	2	0	0
Pit 18	***5***	0	2	0	1	1	1	0	0	0	0
Pit 19	***1***	0	1	0	0	0	0	0	0	0	0
Pit 20	***11***	0	0	2	3	1	4	1	0	0	0
Pit 20A	***2***	0	0	0	0	1	0	0	1	0	0
Pit 21	***2***	0	0	1	0	1	0	0	0	0	0
Pit 22	***1***	0	0	0	0	0	0	1	0	0	0
Pit 23	***8***	0	0	1	3	1	2	0	1	0	0
Pit 25	***2***	0	0	1	0	0	1	0	0	0	0
Pit 26	***6***	0	0	0	1	2	2	1	0	0	0
Pit 27	***1***	0	0	0	0	0	1	0	0	0	0
Pit 27A	***2***	0	0	0	0	0	0	0	1	1	0
Pit 28	***1***	0	0	0	0	1	0	0	0	0	0
Pit 32	***0***	0	0	0	0	0	0	0	0	0	0
Pit 33	***4***	0	0	1	1	0	2	0	0	0	0
Pit 33A	***5***	0	0	2	0	1	1	0	1	0	0
Pit 33B	***1***	0	0	0	0	0	1	0	0	0	0
Pit 34	***7***	0	0	0	1	2	0	2	1	0	1
Pit 35	***4***	0	0	1	0	0	0	1	2	0	0
Pit 36	***0***	0	0	0	0	0	0	0	0	0	0
Pit 38	***1***	0	0	0	0	1	0	0	0	0	0
Pit 38A	***9***	0	0	2	1	1	4	1	0	0	0
Pit 39	***2***	0	0	1	0	0	1	0	0	0	0
Pit 40	***10***	0	0	2	3	1	2	2	0	0	0
Pit 43	***4***	0	0	0	0	2	1	0	1	0	0
Pit 44	***0***	0	0	0	0	0	0	0	0	0	0
Pit 46	***3***	0	0	1	0	0	2	0	0	0	0
Pit 49	***0***	0	0	0	0	0	0	0	0	0	0
Pit 50	***6***	0	0	2	2	0	2	0	0	0	0
Pit 100	***6***	0	0	1	0	1	2	1	1	0	0
Trench 13	***3***	0	0	1	1	0	1	0	0	0	0
Trench 19	***9***	0	0	1	1	0	4	2	1	0	0
Trench 31	***0***	0	0	0	0	0	1	0	1	0	0
Trench 37	***2***	0	0	0	0	0	0	0	0	0	0
uncertain	***1***	0	1	0	0	0	0	0	0	0	0
Total	***205***	0	8	26	34	37	53	24	20	2	1

and an inturned neck. They measure 10.0 cm to 17.6 cm in RD and seem to have a relatively deeper shape. Four specimens are painted with a narrow band on the rim, one with semicircles on the external side of the rim, and two with vertical or oblique strokes on the horizontal register demarcated by parallel bands on the external side of the rim. All specimens are finished by both rotational and non-rotational techniques. No specimen is burnished.

[Type 9]

This type is represented by three specimens having Neck Type 3 and Body Type 3. They show a range of 8.8 cm to 15.3 cm in RD. One specimen has a narrow groove on the external side of the rim. Three specimens are painted with a narrow band on the rim, and one with parallel strokes arranged vertically. All are finished by both rotational and non-rotational techniques. One specimen is streak-burnished.

[Type 10]

This type, which is defined as having Neck Type 4 and Body Type 1 numbers 43 specimens. They measure 7.4 cm to 43.0 cm in RD. There are two types in the body shapes, i.e. one type having an incurved body (22 specimens) and another with a straight neck and body (20 specimens). The rim shapes can also be classified into two types, i.e. one with a simply rounded rim (17 specimens) and another with a shortly projecting rim (25 specimens). Among those with a straight neck and body, 11 specimens have a slurry applied on the external side of the body.

Twenty-four specimens are painted with a narrow band on the rim, one with parallel vertical strokes on the external side of the rim and one with loops on both the internal and external side of the rim-neck portion.

Thirty-nine specimens are finished using both rotational and non-rotational techniques and three specimens by only rotational technique. One specimen cannot be identified due to its preservation. One specimen is streak-burnished.

[Type 11]

This type, which is represented by Neck Type 4 and Body Type 2, numbers four specimens. They measure 11.2 cm to 15.0 cm in RD. Four specimens are painted with a narrow band on the rim and one with parallel vertical strokes on the internal side of the rim. All are finished by both rotational and non-rotational techniques. No specimen is streak-burnished.

[Type 12]

This type is represented by five specimens defined as having Neck Type 4 and Body Type 3. They show a range of 7.5 cm to 23.9 cm in RD. Three specimens have a simply rounded rim and the other two show a shortly projecting rim. Two specimens are painted with a narrow band on the rim. All are finished by both rotational and non-rotational techniques. One specimen is streak-burnished.

2.4 Base fragments of Pots or Bowls

(FIgures 4.12 - 4.13)

The base portion is represented by 205 specimens. Most cannot be determined whether or not they belong to Pots or Bowls. Four Pots including the base portion were recovered. The base form can be classified into the following types.

Type 1 Flat base, including those that are slightly bulging towards their centre.
Type 2 Disc base.
Type 3 Ring base.

All the types are modelled by adding clay to a rounded base that is made in the first stage of modelling. No base is string-cut. Among those with a ring base, the centre of the base projects downwards beyond the ring.

In 20 specimens, mat impressions are identified on the external surface of the bases as they were placed on mats when being modelled or dried.



Figure 4.12 Finishing techniques of bases



Figure 4.13 Finishing techniques of bases

2.5 Dish-on-stands

Only seven Dish-on-Stands were recovered from the excavations. Of them, eight specimens are pedestal fragments and one is a joint portion between the dish and the pedestal.

Nos. 1339, 214, 589 and 1266 have the pedestal rim intact. No. 1339 has a slightly thickened rim with black bands on the rim and the body. Nos. 1339 and 589 are distinguished by their simple rims. No. 1266 exhibits a low profile with a clubbed rim. Nos. 45 and 867 are intact on the stems. No. 45 is painted with parallel bands. No. 867 is streak burinished on its external side. No. 1130 has the joint portion between the dish and the pedestal. Its external side of the base exhibits incised grooves which appears to have been for jointing the pedestal to the dish firmly.

2.6 Spouted vessel

Only one Spouted Vessel was recovered. It is a body fragment from Pit 50 that is crudely finished. A perforation is observed near its upper edge. Around the perforation clay is applied that may have been intended as a spout. Applied clay is noticeable in another part of the external surface. It belongs to the plain Red ware type.

2.7 Handles

Thirteen specimens of handle fragments were recovered. They show a variation in section from circular, to oblong and rectangular. Although they are likely to have been attached to Pots or Bowls, only one specimen of a Pot (no. 282) is intact with a handle, the ends of which are attached to the rim and the body. The pot itself is elliptical in body shape with a short neck, and is executed with a neck band, parallel bands on the shoulder and comb-incised grooves on the body. The handle is circular in section and painted with wide black bands near both ends and parallel narrow bands in the middle.

2.8 Slurry
(Figures 4.14 - 4.15)

117 specimens of Pots and Bowls have an applied slurry on their external side. Among them, 56 belong to Pots and 14 specimens to Bowls. They show a variation from thin to very thick. In those with a thin layer of slurry, traces of applying with instruments having a wide straight end can be observed. The slurries were applied without rotation.

Although no complete specimen with a slurry was found, slurries were evidently applied from the shoulder down to the bottom in the case of Pots. In the case of Bowls, there are specimens that are coated with a slurry over the entire external surface.

2.9 Post-firing graffiti
(Figures 4.16 - 4.17)

Twenty-one specimens exhibit post-firing graffiti on the surface. Among them 20 are Pots and one is Bowl.

Fragments of Pots

Thirty-four pot fragments show several oblique strokes in various angles that overlap with each other. On no. 959, zigzag patterns are indicated by oblique lines. On no. No. 245, two oblique strokes are intact. No. 1096 exhibits star-like motif. Four oblique strokes are intact in no. 1075. In no. 1090 oblique strokes are executed in irregular directions, overlapping parallel grooves. No. 457 shows three diverged strokes. In no. 1176 one vertical line is engraved near the bottom. In no. 100, vertical and oblique lines are executed on the internal surface of the neck. A wavy line and oblique lines are observed in no. 291. No. 362 exhibits five oblique lines near the flat base. No. 269 is engraved



Figure 4.14   Slurry



Figure 4.15 Slurry

with a crisscross on its internal surface. A bird-like figure is seen in no. 289, though only a part of its body and legs are intact. A tree-like motif depicted by a vertical line and V-shaped oblique lines is intact over parallel grooves. A part of a horizontal incised line is intact on the upper edge. No. 88 shows oblique lines. In no. 1349, a part of incised lines are intact. Parallel horizontal lines densely arranged, a vertical line and an oblique line are observed in no. 955. It is not clear whether a circle by pecking on the top of the vertical stroke is an original feature of the specimen or not. A Y-shaped motif is intact at the juncture between the neck and the body in no. 975. No. 1245 exhibits parallel vertical lines over a black band on the body.

Fragment of Bowl

On only one specimen of a Bowl (no. 763) is post-firing graffiti identified. One oblique line is observed on the internal surface of its rim.

3 GREY WARE

3.1 Outline

Examples of Grey ware are much less in number than Red ware. They consists of Pots, Bowls and Dish-on-Stands.

Pots	3
Bowls	17
Dish-on-Stands	1
Body sherd of Pots or Bowls	7

On Pots, two specimens belong to short-necked pots and one represents a body sherd with incised decorations. For Bowls, those with out-curved necks are dominant and most of them are finished with streak burnishing. All forms are finished using rotational and non-rotational techniques.

3.2 Pots

Three specimens were identified as Pots. One specimen is intact with its rim-neck portion (no. 274), having a 19.3 cm RD. It is applied with grey slip on its external side. No. 1125 is a neck sherd representing short-necked Pot. A grey slip is intact on the internal side. 1129 is a body fragment with an incised decoration having a vertical zigzag pattern. It is applied with a grey slip on its external side.

3.3 Bowls

Seventeen specimens of Bowls are found. They can be classified into the following types.

Type 1 Those having an out-curved neck and a hemispherical body.
Type 2 Those having an out-curved neck and a carinated body.
Type 3 Those having a straight out-turned neck and body.
Type 4 Those having a shallow shape with a straight out-turned neck and body.

[Type 1]

The nine specimens included in this type have an out-curved neck and a hemispherical body. One of them has a thickened rim, while the others are simply out-curved. They show a range of 14.7 cm to 32.2 cm in RD. On no. 200 shallow ledges are made on the body.

[Type 2]

This type is distinguished by an out-curved neck and a carinated body. Two specimens (nos. 91, 1208) represent this type. No. 91 has an intact rim, which is painted with a narrow black band. It measures 11.5 cm in RD and 11.1 cm in BD (body diameter). In no. 1208, the entire shape is similar to that of no. 91, although the rim is missing. It measures 21.8 cm in

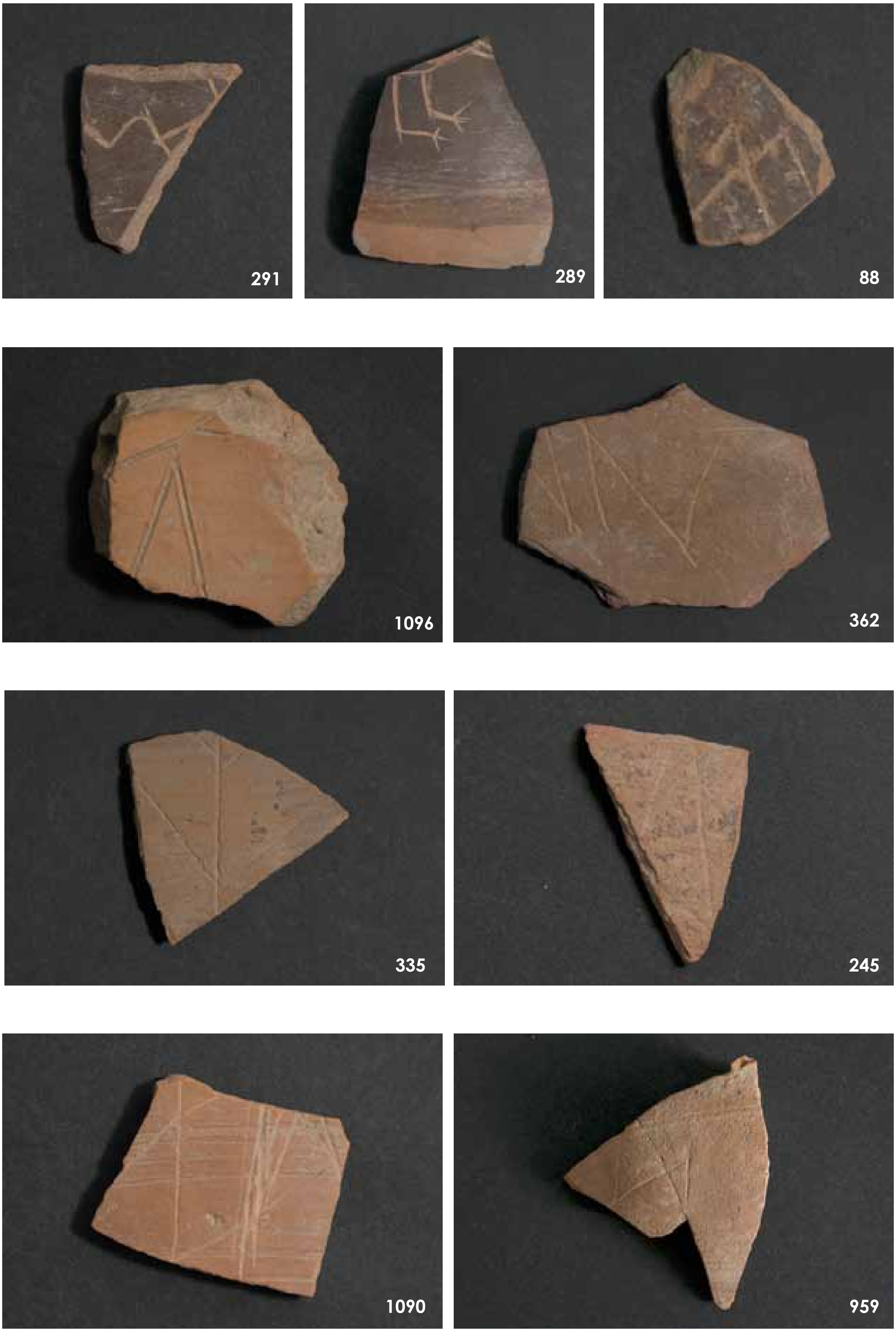


Figure 4.16 Post-firing graffiti



Figure 4.17 Post-firing graffiti

BD. Both specimens are finished by streak burnishing.

[Type 3]

Two specimens represents this type (nos. 710, 1036). No. 710 has a neck thickened on its internal side, measuring 13.4 cm in RD. It is applied with black slip on both sides. No. 1036 has a slightly thickened rim. It measures 29.8 cm in RD. It is slipped in grey and finished by streak burnishing.

[Type 4]

This type is represented by one specimen (no. 745). It has a shallow shape with a straight out-turned neck and body. The rim is slightly out-curved. It measures 27.9 cm in RD.

3.4 Dish-on-stands

The Dish-on-Stand is represented by one specimen (no. 1267). It is a fragment of a pedestal having a projecting rim. It measures 23.6 cm in BSD (base diameter). It is slipped in grey on both sides and finished by streak burnishing. Whereas it is burnished horizontally on the internal side, the external side is executed both horizontally and vertically.

4 BLACK-AND-RED WARE

Two body sherds (nos. 339, 501) were identified as the BRW (Black-and- Red ware). They have a red colour on the external side and black colour on the internal side. The black colour was not by painting but by adsorption of carbon. Both surfaces are finished by streak burnishing in irregular directions.

5 CONTEXT-WISE OCCURRENCE

Based on the discussions above, the pit-wise distributions of pottery are discussed in this section (see Figures 4.18 - 244).

[Pit no. 1] (Figure 4.18)

Thirty-two specimens of Red ware are documented in this pit, among which 24 are Pots, three Bowls and five base fragments.

Among Pots, 14 rim sherds are included. 12 specimens have Rim Type 1 and two Rim Type 2. In the RD Classes, they are distributed through Classes 2 to 7, among which Class 3 is dominant. In the NH/RD classes, they occur in Classes 1 and 2. No. 24 has a rim out-turned and drooped. No. 15 may have an elliptical body with a carination or a ridge. No. 16 is likely to have a similar shape. In no. 23, a luted edge in the manufacturing process can be observed on the upper edge of the fragment. It has a slurry applied on its external side.

Twenty Pots are painted and four are unpainted. Those painted all exhibit monochrome painting. Among those, on which rim-neck painting pattern can be seen (13 in number), 12 specimens belong to Pattern 1, while the rest (one specimen) has no rim-neck band though it is painted with parallel bands on the body. Five specimens have discernible body painting, among which two specimens represent Pattern 1, and one specimen each in Pattern 2 and Pattern 4. No. 18 shows a horizontal band and concentric semicircles in painting in combination with incised dots. In no. 20 a part of a plant motif is intact under parallel horizontal bands.

Two specimens are executed with parallel grooves, both belonging to Pattern 1. One specimen (not illustrated) shows a part of a curvilinear band in black over parallel grooves.

For Bowls, Types 1, 5 and 6 are represented in one specimen each. All specimens are painted with a narrow black band on the rim. In no. 27, semicircles are painted on the internal side of the rim.

For base fragments, three specimens belong to flat bases, and one each to a disc base and a ring base.

[Pit no. 5] (Figure 4.19)

Only two sherds coming from Pots were found. No. 33 is a rim-neck fragment with Rim Type 1 and the Neck Painting Pattern 1. Another specimen (no. 34) is executed with parallel grooves (Pattern 1).

[Pit no. 6] (Figure 4.20)

Three fragments of the rim-neck portions of Pots were identified. Two have Rim Type 1 and one specimen represents Rim Type 3. For the neck painting pattern, two specimens exhibit Pattern 1 and one specimen shows Pattern 2.

[Pit no. 7A] (Figure 4.21)

Fifteen specimens of Red ware were documented, among which seven represents Pots, four Bowls, three base fragments, and one a Dish-on-Stand.

For Pots, three specimens are intact with their rim-neck portions. All belong to Rim Type 1. They are categorized in the RD Classes 3 and 4 and the NH/RD Class 2. In one body fragment (no. 38), a luted portion in the manufacturing technique can be observed on the upper edge of the fragment.

Among Pots, six specimens are painted and one is unpainted. The painted ones are all monochrome. The neck painting pattern can be identified on three specimens, which show Pattern 1 on two specimens and Pattern 2 on one. Three specimens have body painting patterns, among which two represent Pattern 1 and one Pattern 2. No. 42 is painted with a set of parallel vertical strokes on the internal side of the rim.

The specimens of Bowls are represented by Types 1, 4, 5 and 11. Two specimens are painted with a narrow black band on their rim.

For the base fragments, one specimen each is identified respectively as a flat base, a disc base and a ring base. In one specimen of flat bases (no. 52), a slurry is applied to its external side.

One fragment of the Dish-on-Stand (no. 45) represents a pedestal portion having four parallel bands on its external side.

[Pit no. 8] (Figure 4.22)

Thirty-two specimens of potsherds were recovered from this pit, among which 31 belong to Red ware and one is Grey ware. Of Red ware, 18 specimens are Pots, eight Bowls, five base fragments, one a handle fragment, and two specimens of the Grey ware are Bowl.

Of the Red ware Pots, four specimens have their rim-neck portion, among which three represent Rim Type 1 and one Rim Type 2. They are categorized in the RD Classes 2 to 4 and the NH/RD Classes 2 to 4. No. 61 is likely to have had an elliptical body.

For Pots, 12 specimens are painted and six are unpainted. Ten of the painted ones have monochrome paintings and two polychrome paintings. Four specimens have their rim-neck painting pattern evident, of which two are Pattern 1 and two are Pattern 3. The body painting pattern can be seen in six specimens, among which three represent Pattern 1, two Pattern 2 and one Pattern 4. In no. 56, a medium rim-neck band and parallel horizontal bands on the body are painted. In no. 61, the neck portion is widely painted with a black band and the body portion is painted with parallel horizontal bands and a wavy band on the shoulder and with a horizontal band on the middle of the body. A red slip is executed from the rim to the shoulder before black paintings. No. 60 exhibits narrow and wide parallel bands in re. No. 64 is executed with a wide black band on the neck and parallel horizontal bands on the shoulder. A white-slipped surface is placed between the two. In no. 59, parallel horizontal bands are painted under more than four wavy bands. The painted motif cannot be determined in no. 58 due to its limited preservation. Also in nos. 57 and 68, the painted motif is uncertain.

In those examples with polychrome paintings, no. 62 exhibits black lenticular outlines and white fillings. In no. 63 a motif consisting of black dots and a white circle overlapping the former is painted over a red-slipped surface beneath parallel bands over a white-slipped surface.

Six Grooved Pots were identified, among which

four represent Pattern 1 and two Pattern 2. As mentioned above, no. 68 is painted in black with an uncertain motif.

For Bowls, Types 2, 4, 5, 8 and 10 are represented. Two specimens are painted with a narrow black band on the rim, in which no. 77 is also painted with multiple loops, no. 78 is painted in black with semicircles on the internal side of the rim. In no. 66, parallel wavy grooves are incised on its internal side.

For base fragments, one specimen each represents respectively a flat base and a disc base, and two specimens exhibit ring bases. One fragment of a handle portion has an oblong section.

One specimen of Grey ware Bowl (no. 73) has an out-turned neck with thickened section. It is finished by streak burnishing on its external side.

[Pit no. 8A] (Figures 4.23, 4.101)

Fifteen sherds were recovered, among which 13 specimens are Red ware and two specimens are Grey Ware. Among the Red ware fragments, four Pots, six Bowls, and three base fragments are included. The two specimens of Grey ware are both Bowls.

For Pots, two specimens have their rim-neck portions intact and both exhibit Rim Type 1. They belong to the RD Classes 3 and 5, and to the NH/RD Class 2.

Of the fragments of Pots, three specimens are painted, all monochrome, and one is unpainted. Three specimens have their rim-neck painting, one of which is Pattern 1 and two of which are Pattern 2. In no. 88, post-firing graffiti is intact over the black band.

The Grooved Pot is represented by one specimen (no. 87), belonging to Pattern 2.

For Bowls, Types 1, 5, 6, 10 and 12 were identified. Five specimens are painted with a narrow black band on the rim. In no. 92, semicircles are painted on the internal side of the rim and in no. 93, loops are painted on the same portion as the former.

Base fragments include one specimen of a flat base and two specimens of ring bases. The former has an applied slurry on its external side.

The two specimens of the Grey ware are Bowls. No. 91 is distinguished by a carination or a ridge on its body and an out-curved neck. It is painted with a narrow black band on the rim and is finished by streak burnishing.

[Pit no. 10] (Figures 4.24, 4.102 - 104)

Twenty-five specimens of Red ware were found, among which were 17 Pots, six Bowls and two base fragments.

For Pots, six specimens have their rim-neck portions intact, with five of Rim Type 1 and one of Rim Type 2. They are distributed in the RD Classes 2 to 5 and in the NH/RD Classes 1 to 4. In the NH/RD Classes, Class 1 is dominant. Of those with the body portion intact, no. 106 has a globular body. No. 109 has a ledge at the juncture between the neck and the body and a carination or a ridge on the body.

Thirteen Pot specimens are painted and three are unpainted. Of the painted ones, 12 are monochrome and one polychrome. The rim-neck painting pattern can be identified on seven specimens, among which five specimens belong to Pattern 1 and one each to Patterns 2 and 3. In two specimens, the body painting pattern can be discerned, both of which exhibit Pattern 1.

No. 100 is a tall-necked vase with a white slip and a medium black band covering the rim and the upper part of the neck portion. Post-firing graffiti are incised on the internal side of the neck. No. 105 exhibits paintings on the body in addition to the rim-neck portion. No. 113 exhibits parallel lenticular bands in black.

No. 111 exhibits polychrome paintings. A white colour fills the inside of the black outlines. Its overall design is uncertain.

One specimen (no. 115) has parallel grooves (Pattern 1) and parallel black bands. A white slip is applied on the shoulder.

For Bowls, Types 1, 4 and 10 are identified. In nos. 121 and 121, semicircles are painted on the internal side of the rim. Nos. 118 and 119 are distinguished by

their short and thickened rims.

The base fragments represent flat bases. No. 123 is finished by rough scraping without rotation on its external side, which has a rounded base shape.

[Pit no. 11] (Figures 4.15 - 4.29, 4.105 - 4.116)

Ninety-five specimens of potsherds were recovered, among which there were 93 specimens of Red ware and two specimens of Grey ware. Of Red ware, 58 Pots, 27 Bowls, five base fragments, one Dish-on-Stand and one handle fragment are represented. The two specimens of Grey ware recovered are both Bowls.

Twenty-seven rim-neck fragments were among the Red ware Pots, and all exhibit Rim Type 1. In the RD Class, they are concetrated in Classes 2 to 4, but four specimens occur in Class 6 showing a larger size. The NH/RD Classes show a distribution in Classes 1 to 5, though they concentrate in Classes 1 and 2.

In terms of the body shape of Pots, globular bodiesy (nos. 170, 131, 171, 153, 143), elliptical bodies (nos. 128, 175) and carinated or ridged bodiesy (nos. 162, 125) are evident. In a fragment from the lower part of the body (no. 184), a luted edge of the manufacturing process on the upper edge of the fragment can be observed.

Forty-six specimens of Pots are painted in monochrome colour and one polychrome. Of fragments with their rim-neck portions intact, 17 specimens are covered with a wide band from their rims to the body portions. In those identified by their body painting patterns, Pattern 2 occurs in eight specimens. In nos. 170 and 138, intersecting loops are painted on the internal side of the rim. Parallel vertical stokes on no. 126 and semicircles in no. 140 are painted on the same portion as that of nos. 170 and 138. No. 131 has a tall neck and a globular body and is painted with parallel and wavy bands on its shoulder. Also in nos. 174 and 173, multiple wavy and parallel bands are discernible. In no. 162 with the carinated body, a part of parallel bands and some curvilinear strokes are intact, but its entire painted design is uncertain due to its largely rubbed-off surface. No. 168 shows a motif consisting of several curvilinear strokes that may represent a figurative motif. In no. 175 multiple bands cover a wide area of the body.

In no. 166, which has polychrome paintings, parallel curvilinear bands in black and white are painted on the body while the neck portion is covered by a wide band and the shoulder portion is painted with parallel bands.

Two specimens (165, 182) are adorned with incised patterns. In no. 183, a notched appliqué band and incised lines in a vertical zigzag pattern are evident.

Three Pot fragments have an applied slurry. In no. 149, it is applied from the shoulder to the body. no. 184 exhibits a thick layer of slurry on the lower part of the body.

For Bowls, Types 1, 3, 4, 5, 6, 7, 10 and 11 were identified, among which Type 10 outnumbers others. They are distributed in RD Classes 4 to 7. Sixteen specimens are painted, among which 15 are adorned with a narrow black band on the rim and one (no. 208) with an entirely black-painted surface. On no. 189, parallel vertical strokes are painted on its external side, and on no. 185 multiple loops are painted on the internal side of the rim. Four specimens have an applied slurry on their external side.

Among base fragments, four specimens exhibit flat bases and one represents a disc base. On no. 215, the surface is streak-burnished. Nos. 219 and 218 have a slurry applied on their external side. No. 217 has a disc base that is entirely finished by smoothing with rotation.

The one specimen of a Dish-on-Stand (no. 214) is represented by the pedestal portion, which shows a splayed-out profile. It measures 12.0 cm in BSD, which shows a small size. The one fragment of a handle (no. 220) has a plano-convex section.

The two specimens of Grey ware (nos. 210, 200) are distinguished by out-curved necks. No. 210 is finished by streak burnishing.

[Pit no. 13] (Figures 4.30 - 4.31, 4.117 - 4.122)

Thirty-eight specimens of Red ware were recovered, among which 25 specimens are Pots, nine Bowls and four base fragments.

The 11 specimens of Pots have their rim-neck portions intact. Among these, 10 specimens are of Rim Type 1 and one of Rim Type 2. They occur in the RD Classes 2 to 4 and in the NH/RD Classes 1 to 4, although Classes 1 and 2 are dominant.

In terms of body shapes, no. 15 shows an inverted elliptical shape. No. 229 is likely to have an elliptical shape. No. 234, a small pot, has a carinated body.

Fifteen specimens are painted and 10 are unpainted. Of the painted ones, 12 are monochrome and three are polychrome. In five specimens the rim-neck painting pattern can be identified. Four of these are Pattern 1 and one is Pattern 2. For body paintings, no. 234 is painted with concentric semicircles above a horizontal band. In nos. 239, 240, 241 and 238, parts of some large motif are intact, but the entire pattern cannot be identified.

Four specimens are adorned with incised patterns. One specimen (no. 242) has a notched appliqué band as well as incised patterns. No. 246 exhibits a vertical zigzag pattern and no. 243 is executed with oblique chequerboard pattern beneath a neck black band. In no. 128 a pattern of incised lines is indiscernible.

For Bowls, Types 1, 4, 6 and 10 are represented. They make occurrences throughout RD Classes 2 to 8. Four specimens are painted with a narrow black band on the rim. No. 250 is painted with semicircles on the internal side of the rim. In nos. 251 and 254, a slurry was applied to their external surface.

[Pit no. 14] (Figures 4.32 - 4.36, 4.123 - 4.136)

One hundred ten specimens of pottery, the largest number among pits, are found in Pit 14. Among them, 108 are of Red ware, one Grey ware and Black-and-Red ware. The Red ware consists of 80 specimens of Pots, 15 specimens of Bowls, 11 base fragments and three fragments. The Grey ware is represented by a Pot and the Black-and-Red ware is a body fragment of a Pot or a Bowl.

Twenty-four specimens of Pots have intact rims. Of these, 22 are Rim Type 1 and two are Rim Type 2. In the RD Class, Class 3 numbers the largest amount, whereas they occur in a range of Classes 2 to 5. In the NH/RD Classes, Classes 1 and 2 are dominant, while only one specimen is included in Class 3.

In terms of body shapes, nos. 281, 283, 282, 289 and 285 are elliptical, and nos. 277, 280, 279, 308, 316, 321 and 286 indicate a globular shape. In no. 282, a handle is attached to the rim and the body. No. 286 has a disc base and no. 321 is distinguished by a large flat base.

For Pots, 48 specimens are painted and 32 are unpainted. The painted ones are all monochrome. Thirty-one specimens have their rim-neck painting pattern, which 21 are of Pattern 1, six Pattern 2, and four Pattern 3. Body painting patterns are discernible in 15 specimens, in which 12 are of Pattern 1 and three of Pattern 2.

Only one specimen is adorned with incised decorations representing a vertical zigzag pattern.

Grooved ware is represented by 20 specimens, among which 12 exhibit Pattern 1, seven Pattern 2 and one Pattern 3. In no. 322 of Pattern 1, wavy grooves are exceptionally added to the horizontal grooves. In no. 335 post-firing graffiti is executed over the grooves. In Pattern 2, the arrangements of grooves can be observed on nos. 282 and 321. On no. 282, sets of three straight grooves and sets of three wavy grooves are alternately arranged. In no. 321, two sets of four straight grooves are executed on the shoulder and the middle of the body and four sets of wavy grooves are filled in-between.

Eight specimens of Pots show a slurry application. No. 277, which is a large fragment of the rim-neck and body portions, has a thin slurry applied on the lower part of the body. No. 316 is similar. In nos. 314 and 315, striae from the application of slurry with a tool having a straight edge can be observed.

For Bowls, Types 1, 3, 4, 5, 8 and 10 were identified. In no. 344, multiple loops are painted

on the internal side of the rim. No. 351 exhibits intersecting semicircles on the internal side of the rim. On no. 350, circles are painted on the external side of the rim. No. 354 has an applied slurry. On no. 340, which has an incurved neck, parallel oblique strokes are painted on the external side of the neck. No. 343 is painted with loops on both the internal and external sides of the rim. No. 349 which is intact only with its rim-neck portion, is painted black on its external side.

For base fragments, the flat base is dominant. No. 362 is executed with post-firing graffiti in a zigzag pattern. Nos. 363 and 368 have a slurry applied.

For handle fragments, two specimens have a rectangular section (nos. 357, 358) and one (no. 356) a circular section.

One specimen of Grey ware n(no. 719) is a rim-neck fragment of a Pot, measuring 18.0 cm in RD. It has a grey slip. The Black-and-Red ware fragment (no. 339) is a body sherd of a Pot or a Bowl. It is red on the internal side and black on the external side. It is finished by streak burnishing in irregular directions.

[Pit no. 15] (Figure 37)

Seventeen specimens of Red ware were found in this pit, among which five are of Pots, eight are of Bowls and four are of base fragments.

The specimens of Pots are all body fragments, two painted ones and three unpainted ones. No. 1272 has a black band on the neck and is finished by streak burnishing on the external side. No. 370, which is a fragment of the middle part of the body, is likely to have been painted in black from the rim to the body. Three plain sherds indicate a globular shape in no. 372 and an elliptical shape in no. 373. No. 371 has an applied slurry.

For Bowls, Types 3, 4, 5 and 10 are represented. Six specimens are painted with a narrow black band on the rim. No. 375 is intact with a part of some black paintings on the body. No. 376 has an applied slurry.

The base fragments consist of three specimens of flat bases and one specimen of a disc base. In nos. 385 and 385 a slurry is applied.

[Pit no. 16] (Figure 4.38 - 4.39, 4.137 - 4.138)

Forty-four specimens of Red ware were found in this pit. Twenty-six are Pots, 11 are Bowls and seven are base fragments. Ten of the Pots, which are intact with their rims, are all of Rim Type 1 ranging in RD Classes 2 to 4. In the NH/RD Classes, Classes 1 and 2 and dominant, while only one specimen belongs to Class 4.

Fourteen painted specimens and 12 unpainted specimens are included among the Pots. Of the 11 specimens that are identifiable with their rim-neck painting patterns, five are of Pattern 1 and six of Pattern 2. For the body sherds, no. 410, which represents the lower part of the body, exhibits three colours of slips and paintings, i.e. red, dark red and black. In no. 402, a relatively wide band is painted on the shoulder. No. 401 shows parallel bands and more than three wavy bands. No. 399, which is a small pot with a carination on the body, is painted with a horizontal band and concentric semicircles on the body.

Two specimens are adorned with incised decorations in a vertical zigzag pattern. No. 408, which is a shoulder portion of a Pot, has incised lines on the shoulder. No. 403 represents a fragment of the middle part of the body with the lower edge of incised patterns.

Five specimens have a slurry applied on their external side. On no. 395, which is intact with a part of the neck and the body, has a thin slurry beneath the shoulder. In nos. 412, 407 and 405, luted edges of the manufacturing process can be observed.

For Bowls, Type 1, 4, 6, 7 and 10 were identified. In no. 419, intersecting loops are painted on the internal side of the rim and in no. 420 multiple loops are arranged on the same portion. Nos. 423 and 422 exhibit a slurry on their external side.

For base fragments, six specimens of flat bases and one of a ring base are represented. In no. 420, a black band is painted on the lower part of the body near the base. Nos. 424, 1458 and 429 are applied with a slurry.

[Pit no. 18] (Figures 4.41 - 4.43, 4.139 - 4.148)

The specimens from this pit are all of Red ware. 27 specimens of Pots, five Bowls and 11 base fragments are included.

Fourteen specimens of Pots, which are intact with their rims, all belong to Rim Type 1. They are distributed in the RD Class 2 to 4 and the NH/RD Classes 1 to 4.

In terms of body shapes, nos. 440, 433, 454 and 463 are globular, and nos. 430 and 453 are of an elliptical shape. Nos. 446 and 447 are distinguished by a carination on the body. No. 450 seems likely to have a long elliptical body.

In terms of painting, 19 specimens are monochrome and one is polychrome paintings. In 15 specimens that have discernible rim-neck painting patterns, six represent Pattern 1, seven Pattern 2 and two Pattern 3. For body painting, two specimens belong to Pattern 1 and one specimen each to Patterns 2 and 3. No. 449, which is a large fragment, is painted with three parallel bands. No. 448 shows one band. In no. 450, parallel bands are painted over a wide area of the body.

In one polychrome specimen (no. 451), only a part of the paintings is intact. A white colour is filled in the black outlines.

Four specimens of Pots have an applied slurry. No. 439 which has a rim-neck portion, has a slurry applied beneath its shoulder. In no. 454 slurry is executed over a wide area of the body. No. 463 exhibits slurry on the lower part of the body.

For Bowls, Types 4, 6, 8 and 9 are represented. Nos. 467 and 468 have an identical shape with a shallow body and a horizontally projecting rim. A narrow black band is painted on the rim and semicircles are on the internal side of the rim. Nos. 469 and 466 are painted with a narrow black band on the rim.

For base fragments, nine specimens are of flat bases, and one specimen each is of a disc base and a ring base. Five specimens of flat bases has an applied slurry.

[Pit no. 19] (Figure 44)

Five specimens of Red ware were found, among which three Pots, one Bowl and one base fragments are included.

The two specimens of Pots has its rim intact and the one is a body fragment. One of those with rims (no. 470) is painted with a wide black band from the rim to the body. In no. 472, a body fragment, parallel grooves (Pattern 3) are executed.

The one specimen of a Bowl is of Type 12. It has a shallow body and a narrow band on the rim. Rough scrapings in irregular directions are executed on the lower part of the body.

The one base fragment (474) exhibits a flat base.

[Pit no. 20] (Figures 4.45 - 4.47, 4.139 - 4.156)

Among the 72 specimens in total, 68 are of Red ware, three of Grey ware and one of Black-and-Red ware. In Red ware, 35 specimens represent Pots, 18 Bowls, nine base fragments, and one a handle fragment. In Grey ware, there is one specimen of a Bowl and two body fragments that are either Pots or Bowls are seen. The Black-and-Red ware is represented by one body fragment.

Nine specimens have intact rims, among which seven belong to Rim Type 1 and two to Rim Type 3. They are distributed in the RD Classes 2 to 5 and the NH/RD Classes 1 to 4, in which Class 4 is represented by relatively large numbers of specimens.

As for shapes, no. 508 has a very short neck. Nos. 476, 479 and 480 have tall necks and have a shortly out-turned rims. No. 483 is a neck and body fragment with a ledge at the juncture between the neck and the body that is considered a tall neck. Similarly, nos. 486 and 506 have a ledge at the juncture between the neck and the body.

Twenty specimens of Pots are painted and 15 specimens are unpainted. All of the painted ones are monochrome. Among 11 specimens that have identifiable rim-neck patterns, five represent Pattern 1 and two each Patterns 2, 3 and 4. Eight specimens can be discerned with their body painting patterns,

among which four are of Pattern 1, three of Pattern 2 and one of Pattern 4. In no. 477, a part of a vertical band is intact under a wide band on the neck. No. 483 exhibits a wide band on the rim-neck portion and parallel bands on the shoulder. No. 485 is another example having a similar pattern. No. 486 is painted with bands on the neck over a white-slipped surface. On no. 487, a pair of parallel bands are painted. No. 489 shows a wide band on the body. On no. 492, parallel and wavy bands are alternately arranged. On nos. 493 and 494, a part of some motif is intact.

Five specimens of Pots have an applied slurry.

Two specimens are adorned with incised decorations. A vertical zigzag pattern in no. 500 and parallel oblique lines in different directions in no. 499 are represented. Parallel grooves are observed in three specimens, among which one belongs to Pattern 1 and two to Pattern 2. Both are tiny fragments.

For Bowls, Types 1, 4, 5, 6, 8 and 10 were identified. Types 1 and 5 are found in several specimens. In no. 521, multiple loops are painted on the internal side of the rim. In nos. 535 and 523, semicircles occur in the same portion. In no. 520 parallel vertical strokes are painted instead of loops and semicircles. In no. 536 with an incurved neck, semicircles are arranged on the rim at wide intervals.

For base fragments, six specimens represent flat bases and three disc bases. Three specimens of the flat bases has an applied slurry. The specimens with disc bases are entirely finished by smoothing with rotation. The one specimen of a handle fragments is of a circular section.

As for the Grey ware sherds, one specimen is a Bowl with an out-curved neck. It is slipped in grey and is finished by streak burnishing. One body fragment of Black-and-Red ware (no. 371) has a red colour on its external side and a black colour on its internal side, and is finished by streak burnishing in irregular directions.

[Pit no. 20A] (Figure 4.48)

Ten specimens of Red ware were found in this pit. They consist of three Pots, two Bowls and five base fragments.

For Pots, two specimens of Rim Type 1 are included. No. 546 has a tapering rim.

Three specimens have monochrome painting. One specimen, which is discernible with its rim-neck pattern, belongs to Pattern 2. The body sherds are tiny fragments with parallel bands. For Bowls, Types 5 and 6 were identified. No. 550 is of Type 5 and is painted with a narrow black band on the rim. For base fragments, four specimens are flat bases and one is a ring base. No. 554 is a flat base and mat impressions are observed on its external side.

[Pit no. 21] (Figures 4.49 - 4.50)

Forty-one specimens of Red ware were recovered, among which 30 specimens of Pots, three of Bowls, seven of base fragments and one of a Dish-on-Stand are represented.

For Pots, 13 specimens have rims that represent Rim Type 1. As for body shapes, nos. 584, 566, 565 and 579 are globular and nos. 576 and 575 are elliptical in shape.

Twenty-one specimens of Pots are painted and nine are unpainted. For the painted ones, 18 specimens are monochrome and three are polychrome. Among the 10 specimens in which the rim-neck painting patterns are identifiable, seven exhibit Pattern 1 and three represent Patten 2. For body painting patterns, Patterns 1 and 2 number two specimens each respectively.

For polychrome paintings, no. 576 is painted with parallel bands and a wavy band in black with dots of white inside the wavy band. In no. 577, parallel oblique bands and a white filling are intact. No. 574 shows parallel curvilinear bands in black and white.

One specimen is executed with the parallel grooves of Pattern 1. It is painted black on its external side.

Among Bowls, Types 4, 5 and 7 are represented. Nos. 586 and 588 are painted with a narrow black band on the rim. In no. 587 a relatively wide band

covers the rim-neck portion.

Among base fragments, six specimens have flat bases and one a disc base. In no. No. 594 with a flat base has an applied slurry.

One Dish-on-Stand has a splayed-out shape with a wide black painting on its external side. It measures 15.5 cm in BSD.

[Pit no. 22] (Figure 51)

Fifteen potsherds were found in this pit, among which 14 specimens belong to Red ware and one Grey ware, The Red ware specimens include 10 Pots, one Bowl, and three base fragments. The Grey ware specimen is a Bowl.

Four Red ware Pots have intact rims, all of which represent Rim Type 1. No. 600 has a tall neck with a gently out-curved neck and a shortly out-turned rim. No. 601 has a ledge at the juncture between the neck and the body. In terms of body shapes, nos. 602, 603 and 599 are elliptical, and nos. 606 and 604 are globular in shape.

As for Pots, six specimens are painted and four specimens are unpainted. The painted ones are monochrome and have discernible rim-neck painting patterns that represent two specimens each in Patterns 1 and 2 and one specimen each in Patterns 3 and 4. In terms of body painting pattern, one specimen is represented respectively in Patterns 1 and 2. In no. 600 black bands and plain bands are alternately arranged on the external side of the neck. A red slip is executed under its shoulder. In no. 601, a black band covers the external side of the rim-neck portion and parallel bands are painted on the shoulder. No. 598 exhibits semicircles on both the internal and external sides.

In one specimen (no. 605), two rows of dots are observed.

Three specimens has an applied slurry, all of which are plain.

One Bowl of Type 3 (no. 608) is distinguished by a globular body and a short neck.

One Grey ware Bowl (no. 607) has a shape that extends straight obliquely.

[Pit no. 23] (Figure 4.52 - 4.54)

The 53 potsherds, all of Red ware recovered in this pit include 34 Pots, eight Bowls and 11 base fragments.

Nine specimens of Pots has intact rims that represent eight Rim Type 1 and one Type 2. They show ranges of RD Class 2 to 5 and of NH/RD Classes 2 to 4. For shapes, no. 614 which is a large potsherd consists of a globular body and a short neck. Nos. 622 and 624 have a globular body and no. 621 has an elliptical body with a carination. In nos. 642 and 623, a ledge is made at the juncture between the neck and the body. No. 638 with parallel grooves of Pattern 2, has an oblong body.

For Pots, 25 specimens are painted and eight are unpainted. On 11 of the painted ones, the rim-neck patterns are discernible and include eight of Pattern 1, two of Pattern 3 and one of Pattern 3. Six specimens exhibit body painting patterns and include four examples of Pattern 1 and one each of Patterns 3 and 4. In no. 617, the rim-neck portion is painted black and the body is left plain. In no. 623, two wide bands are painted on the neck and body with a plain band left between the two. No. 616 has its rim-neck portion painted black with circles on the internal side of the rim. On no. 633, only parallel bands are intact. On no. 627, a wavy band is independently painted on the body. No. 628 is painted with a pair of parallel oblique bands and a wavy band between the former. On nos. 630 and 626 a relatively wide band is executed. Three parallel bands are painted in no. 634. No. 631 is distinguished by an oblique band. No. 640 has a vertical stroke, but it is not certain whether it was intentional or not.

Two specimens have polychrome paintings. No. 632 shows a pattern consisting of parallel oblique black bands and a white filling. No. 629 exhibits a similar pattern.

Six specimens have parallel grooves, among which two are of Pattern 1 and four are of Pattern 4. No. 641 is of Pattern 1 and is painted with two parallel

bands over parallel grooves. On no. 635 of Pattern 2, parallel grooves are executed under its neck. No. 638 is a large fragment from the lower part of the neck to the middle portion of the body that exhibits two sets of parallel straight grooves on its shoulder and body, between which three sets of wavy grooves are executed.

Two specimens have an applied slurry. No. 645 is globular in shape.

For Bowls, Types 1, 5 and 10 are identified, among which Type 10 is dominant. Six specimens are painted with a narrow black band. No. 646 is intact with an oblique band on its external side. on no. 649, parallel oblique strokes are painted on the external side of the neck.

Of 11 base fragments, nine specimens represent flat bases and two represent disc bases. Three specimens with flat bases have an applied slurry.

[Pit no. 25] (Figure 4.55)

Nine specimens of Red ware were found in this pit, among which five are from Pots, two are from Bowls and one is from base fragment.

The three specimens of Pots are all rim sherds of Rim Type 1. Two specimens of them belong to RD Class 7. No. 665 is likely to be a tall neck. No. 671 has an elliptical body.

Four Pots are painted and one is unpainted. In three specimens, which have discernible rim-neck painting patterns, two represent Pattern 1 and one Pattern 4. No. 670 is a body fragment that seems to be of Pattern 1. In no. 665, two bands are painted respectively on the rim and the neck. No. 670 exhibits post-firing graffiti over a black band.

All Bowls belong to Type 6. No. 666 is relatively small bowl measuring 14.0 cm in RD. All specimens are painted with a narrow black band on the rim. In no. 672, semicircles are painted on the internal side of the rim.

One base fragment (no. 673) is a disc base.

[Pit no. 26] (Figures 4.56 - 4.57, 4.157 - 4.162)

48 potsherds recovered from this pit represent 47 specimens of Red ware and one specimen of Grey ware. The Red ware consists of 36 Pots, six Bowls and six base fragments. The Grey ware sherd is from a Bowl.

Of the Red ware Pots, 17 are intact with their rims, of which 11 of Rim Type 1 and six of Rim Type 2. They are distributed in RD Classes 2 to 6, among which Class 3 counts a large number. In the NH/RD Classes, Classes 1 and 2 are dominant with one specimen in Class 4. In terms of shapes, no. 680 has a prominently out-curved neck. Nos. 687 and 683 are distinguished by their rims with rectangular sections. In terms of body shapes, nos. 678, 682 and 695 are elliptical, and nos. 702 and 691 are globular.

29 of the Pots are painted and seven are unpainted. Of the painted ones, 28 specimens are monochrome and one polychrome. Among the 13 specimens which have identifiable rim-neck painting patterns, seven specimens represent Pattern 1, five Pattern 2 and one Pattern 4. All of the five specimens that are discernible by their body painting patterns exhibit Pattern 1.

In one polychrome specimen (no. 692), parallel black bands and a white filling are arranged between two opposite curvilinear bands. This is also executed with parallel grooves. This may represent an pentagonal design similar to one example from the site of Kunal (Khatri and Acharya 1995).

One specimen (no. 708) is adorned with incised decorations that consist of a vertical zigzag pattern and two rows of incised dots.

Of the nine specimens with parallel grooves, six represent Pattern 1 and three exhibit Pattern 2. No. 702 is globular in shape. On nos. 699, 700 and 702 a horizontal band is accompanied by grooves, and on no. 698 a part of a curvilinear band is intact. As mentioned above, no. 692 is painted with polychrome paintings. No. 709 has an applied slurry.

For Bowls, Types 1, 5 and 12 were identified. No. 716 has a shallow body with carination and an

overturned rim. In five specimens, a narrow black band is painted on the rim. In nos. 712 and 711, semicircles are painted on the internal side of the rim.

Two specimens of base fragments each are of flat bases and ring basesrespectively, and one specimen is a disc base. The two specimens of flat bases have an applied slurry.

One Grey ware Bowl fragment (no. 710) has a rim thickened on its internal side.

[Pit no. 27] (Figure 58)

Two specimens of Red ware were found, one Bowl and one base fragment.

The Bowl (no. 722) has a globular body with a short neck. The other specimen of a base fragment (no. 723) has rounded base though it is classified in Type 1. Multiple incised lines are observed on the internal side of the base, which may have been left on the surface during the manufacturing process.

[Pit no. 27A] (Figure 4.59)

Fourteen specimens of Red ware were found from this pit. They consist of 10 Pots, three Bowls and one base fragment.

Seven Pots have intact rims that represent six Rim Type 1 and one Rim Type 2. They show a distribution in RD Classes 3 to 5. In the NH/RD Classes, they occur in Classes 1, 2 and 4. In terms of shapes, no. 725 has a tall neck consisting of a gently out-curved neck and a shortly out-turned rim. No. 728 is distinguished by a projecting rim of a rectangular section. No. 732 has a carinated body.

For Pots, seven specimens are painted and three are unpainted. The painted ones are all monochrome. The single specimen that has a discernible rim-neck painting pattern, exhibits Pattern 1.

For Bowls, Type 6 and 10 are identified. No. 734, a rim fragment, may belong to Type 10.

The one base fragment (no. 736) represents a flat base and has an applied slurry.

[Pit no. 28] (Figure 4.60)

Nine potsherds are found, among which eight specimens are Red ware and one is of the Grey ware. Of the Red ware, six are Pots, one is a Bowl and one is a base fragment. The Grey ware fragment is from a Bowl.

For Red ware Pots, two specimens have intact rims, all of which are Rim Type 1. They belong to RD Classes 3 and 4 and the NH/RD Class 1. No. 738 is distinguished by a prominently out-curved neck. No. 740 has a squat globular body. On no. 741, a luted edge of the manufacturing process can be observed.

Four specimens of Pots are painted and two are unpainted. The painted ones are all monochrome. One specimen (no. 738) exhibits Pattern 1 on the rim-neck.

The one specimen of a Bowl represents Type 10. It is painted with a narrow black band on its rim. A base fragment (746) is a ring base.

One specimen of a Grey ware Bowl is distinguished by its shallow shape.

[Pit no. 32] (Figure 4.61)

Of six specimens of potsherds, five specimens belong to Red ware and one is Grey ware. Of the Red ware, four specimens represent Pots and one a Bowl. The one specimen of the Grey ware is a body fragment of a Pot or a Bowl.

Two specimens of Red ware Pots represent Rim Type 1 ranging in RD Classes 3 and 4 and the NH/RD Classes 2 and 3. No. 749 exhibits a luted edge from the manufacturing process.

Three specimens of Pots are painted and one is unpainted. In two specimens, the rim-neck painting patterns are discernible. There is one specimen each of Patterns 1 and 2. No specimen exhibits a body painting pattern.

One specimen (no. 751) is executed with a vertical zigzag pattern.

One body fragment of a Bowl (no. 750) is incised with parallel grooves on its internal side.

One fragment of Grey ware (no. 752) is featureless

with grey slip on its external side.

[Pit no. 33] (Figure 4.62)

Thirteen specimens of Pots were found, among which 12 are Red ware and one is Grey ware. In the Red ware, seven specimens of Pots, four specimens of Bowls and one specimen of a base fragment are included. The one fragment of Grey ware is a body fragment of a Pot or a Bowl.

The two specimens that have intact rims represent Rim Type 1. They are relatively large in size as indicated by the RD Classes 5 and 6. Both specimens belong to the NH/RD Class 1. Three specimens are painted and four are unpainted. Only one exhibits Pattern 1 of the rim-neck painting pattern. No specimens are found with the body painting. In no. 754, parallel bands and a part of some motif are intact. No. 758 is incised with parallel grooves and is painted in black on its external side.

Four specimens of grooved pots were found. Three are of Pattern 1 and one is of Pattern 2.

For Bowls, Types 1, 3, 5 and 6 are represented. In nos. 762 and 765, semicircles are painted on the internal side of the rim. No. 763 is distinguished by its sharply carinated body and a prominently out-curved neck. It has post-firing graffiti on the internal side of the rim.

The base fragment is a flat base covered with slurry.

The Grey ware sherd is a featureless fragment of a Pot or a Bowl.

[Pit no. 33A] (Figure 4.63)

The 32 specimens of Red ware were found consisting of 20 Pots, six Bowls and six base fragments.

Of the seven specimens with intact rims, six specimens represent Rim Type 1 and one Rim Type 3. They show distributions in the RD Classes 2 to 5 and the NH/RD Classes 1 to 2. In terms of shapes, no. 774 is a globular body with slurry beneath its shoulder. No. 772 is a neckless Pot with a rectangular rim.

For Pots, 18 specimens are painted and two are unpainted. Of the painted ones, 13 are monochrome and five specimens are of polychrome. In the five specimens which have discernible rim-neck painting, three exhibit Pattern 1, and one each shows Patterns 2 and 3. In the four specimens in which the body painting patterns are identified, one specimen each is in Patterns 1 and 4 and two are in Pattern 2. In no. 772, some motif seems to have been painted, although its subject is unclear. In no. 777, a plant-like motif in a lateral direction is depicted. In no. 781, a white band is shown between black bands on the neck and the shoulder.

Of the polychrome, no. 778 is painted with parallel curvilinear bands in black and white. On no. 1245, a part of parallel band in black and white, and a part of a curvilinear band in white are intact. In no. 1031, one wavy band is painted in white while another wavy band and parallel bands are painted in black. No. 783 has two parallel bands and a curvilinear band filled with a white colour.

Two specimens are adorned with parallel grooves of Pattern 2. In no. 784, a horizontal band is painted over the grooved surface.

For Bowls, Types 1, 3, 4, 10 and 11 are represented. Four specimens are painted with a narrow black band on the rim. No. 789 is painted with semicircles of irregular shapes on both sides.

Among the base fragments, flat base, disc base and ring base are represented respectively by two specimens.

[Pit no. 33B] (Figure 4.64)

Seven specimens of Red ware were recovered, representing five Pots, one Bowl and one a handle fragment.

The two specimens of Pots are rim fragments which are of Rim Type 1. They show distributions in the RD Classes 3 and 4 and the NH/RD Class 2. In terms of shapes, no. 802 has a globular body with a slightly lower gravity. No. 800 shows a luted edge in the manufacturing process.

All Pots are painted in monochrome. Two specimens have discernible rim-neck paintings belonging to Pattern 1. In two specimens that show their body painting, Patterns 2 and 3 are represented by one specimen each. No. 801 exhibits a wavy groove in a narrow space flanked by parallel grooves.

One specimen of a Bowl represents Type 1 with a plain surface. A handle fragment (no. 803) has a rectangular section.

[Pit no. 34] (Figures 4.65 - 4.68, 4.163 - 4.169)

In 72 specimens of Red ware, 53 Pots, eight Bowls, nine base fragments, one Dish-on-Stand and one handle fragment are represented. In the RD Classes they are distributed in Classes 3 to 6, among which Class 4 is dominant. In the NH/RD Classes, Classes 1 and 2 are dominating, while one specimen represents Class 4. In terms of shapes, no. 805 has a tall neck with a projecting rim of a rectangular section. In body shapes nos. 851 and 824 are globular, nos. 839 and 852 are globular with a lower gravity, and nos. 834, 840 and 843 are elliptical. Nos. 835 and 836 have a ledge at the juncture between the neck and the body.

For Pots, 41 specimens are painted and 12 are unpainted. Among the painted specimens, 39 are monochrome and two are polychrome. 22 have discernible rim-neck painting of which 15 specimens show Pattern 1, five Pattern 2, and one each Patterns 3 and 4. In 14 specimens with body painting patterns, 13 represent Pattern 1 and one Pattern 2. In no. 805, the neck portion is painted with two black bands, between which a white-slipped surface is left as a band. In no. 835, a horizontal band is painted on the shoulder, above which is slipped in white. No. 834 is another with a similar pattern that has a white-slipped surface above parallel bands on the shoulder. It is painted with a band on the body as well. No. 836 is entirely slipped in white on its external side and is painted with a wide black band on the neck and parallel grooves on the shoulder. On no. 839, a horn-like motif is largely painted on the body. No. 838 is intact with a part of a curvilinear stroke. No. 1120 has an applied slurry below a black band.

In the two specimens with polychrome paintings, parallel bands in black and red are painted over a white-slipped surface on no. 828 and a white colour fills a black outline in a winding shape on no. 844.

13 specimens are adorned with parallel grooves. Eleven represent Pattern 1 and two Pattern 2. On those with Pattern 1, nos. 840 and 843 are better-preserved fragments having an elliptical shape. On nos. 848 and 844, a part of large motif of some shape is intact. On no. 846, 840, 843 and 847 are painted a black band over the grooved surface. Two specimens with Pattern2 have a globular body and exhibit wavy grooves in a horizontal register demarcate by two sets of parallel straight grooves. No. 852 is slipped in red above the shoulder with a black band.

One specimen with incised decorations (no. 855) is adorned with a vertical zigzag pattern and two rows of incised dots.

For Bowls, Types 2, 5, 9 and 10 are identified. Type 5 represents the largest number. No. 866 of Type 10 has a body extending straight from the body to the rim. No. 863 of Type 10 consists of a shallow body and a triangular rim. Four specimens are painted with a narrow black band on the rim. Semicircles are painted on the internal side of the rim in no. 862. Parallel oblique strokes are painted on the external side in no. 865.

For base fragments, seven specimens represent flat bases and one specimen each a disc base and a ring base. One flat base (no. 875) has an applied slurry.

One Dish-on-Stand (no. 867) is a pedestal fragment with a splayed-out shape. It is burnished on its external side.

A handle fragment (no. 857) shows a circular section.

[Pit no. 35] (Figures 4.69 - 4.70, 4.170 - 4.176)

Of the 59 potsherds recovered, 58 specimens represent Red ware and one specimen Grey ware. Of Red ware, 43 specimens are Pots, five specimens are Bowls and 10 specimens are base fragments. The one

Grey ware example is a body fragment of a Pot or a Bowl.

Seventeen specimens of Pots have intact rims, all of which are Rim Type 1. In the RD Classes, Class 3 is dominant while they show a distribution in Classes 2 to 5. In the NH/RD Classes, Class 2 dominate. In terms of shapes, no. 880 has a tapering rim. In nos. 882 and 884, the neck is prominently out-curved. For body shapes, no. 884 is globular with a lower centre of gravity. Nos. 889, 894 and 895 are likely to have had an elliptical shape. No. 897 has a shallow carination on the body. Nos. 901 and 902 have a ledge at the juncture between the neck and the body.

As for Pots, 33 specimens are painted in monochrome and 10 specimens are unpainted. 21 specimens that have rim-neck painting, 10 specimens are represented by Pattern 1, seven by Pattern2, three by Pattern 3 and one by Pattern 4. On the nine specimens discernible body paintings, eight specimens are Pattern 1 and one is Pattern 2. On no. 887, semicircles are painted on the internal side of the rim. On no. 901, a part of a curvilinear stroke is intact along with bands on the neck and the shoulder, although its entire motif is unclear. On no. 902, bands are painted on the neck and the shoulder. No. 904, a neck fragment, is painted with two bands with a gap between the two. On no. 909, a wide band is executed and finished by streak burnishing. On no. 903, a slurry is applied beneath a wide band. No. 900 is also applied with slurry, beneath a band which seems likely to be a part of a wide band from the rim to the body.

Seven grooved Pots were found, of which six are Pattern 1 and one is Pattern 2. In no. 915, a part of some black paintings are intact. In no. 911 with Pattern 2, three sets of parallel grooves are intact.

For Bowls, Type 1, 5 and 10 are identified. Those of Type 10 are relatively larger in number. Three specimens are painted with a narrow black band on the rim. On no. 925 of Type 10, a part of a handle is intact and is applied with slurry.

For base fragments, six specimens represent flat bases and four disc bases. Three flat bases have an applied slurry.

The one specimen of Grey ware is a featureless body fragment of a Pot or a Bowl.

[Pit no. 36] (Figures 4.71 - 4.76, 4.177 - 4.216)

Of the 49 potsherds, 48 are of Red ware and one is Grey ware. Of the Red ware, 43 specimens are Pots, and five are base fragments. One specimen of Grey ware is a Bowl.

Of the 17 rim sherds of Pots, 14 represent Rim Type 1 and three Rim Type 2. In RD classes, Class 6 is dominant while they are distributed in Classes 2 to 6. In the NH/RD Classes, Classes 1 and 2 count occupy a dominant position. Only two specimens are included in Class 3. In terms of shapes, no. 950 is a neckless Pot with a slightly projecting rim. No. 953 is distinguished by tall and narrow neck. Traces of luting and smoothing without rotations are clearly observed on the internal side. In terms of body shapes, nos. 951, 942, 952 and 946 exhibit globular shapes, and nos. 936, 957, 967, 938, 940, 948, 956, 949, 976, 977, 978 and 969 are elliptical shapes. No. 954 is distinguished by its flat biconical shape. On nos. 949, 976 and 975 a ledge is observed at the juncture between the neck and the body. On no. 949, a projecting rim with a rectangular section accompanies with a tall neck.

On nos. 960, 961, 963, 962 and 964, luting edges from the manufacturing process can be observed. On the edges finger impressions are visible from both sides, which indicate that the modelling of the edge was done so as to make the luting easier and stable. On no. 964 cord impressions are left on its external side. Nos. 960, 961, 962 and 954 are applied with a slurry. Of them, nos. 960, 961 and 962 have a thicker layer of the slurry.

Twenty-eight specimens of Pots are painted monochrome and 15 specimens are unpainted. In 18 specimens which have discernible rim-neck painting, 12 are represented by Pattern 1, five by Pattern 3, and one by Pattern 4. In the body painting patterns, 11 specimens belong to Pattern 1 and two to Pattern 2. On no. 940, a better-preserved fragment, a wide band

is painted on the neck, and parallel grooves and wavy bands are on the shoulder. In addition, one band is painted on the body. No. 953 is painted with two bands on the neck, parallel bands and a wavy band on the shoulder, and parallel bands on the body. On no. 949, a white slip is executed on the internal side of the rim and the entire external side, and a black band is painted on the neck and a red band is on the shoulder. No. 976 exhibits a similar pattern consisting of a wide band on the neck and parallel bands on the shoulder. No. 977 is another example of this pattern. On no. 978, parallel bands are painted widely on the body. On no. 970, parallel horizontal and vertical bands in red are painted on the body. On nos. 969, a narrow band is painted under a wide band that seems likely to have been painted from the rim to the body.

Three specimens are adorned with parallel grooves, all of which are Pattern 3. In no. 976, three parallel straight grooves and three wavy or zigzag grooves are executed beneath parallel black bands on the shoulder. Similarly, wavy grooves are arranged beneath parallel black bands on no. 977. No. 965 is a body fragment only with wavy grooves.

For base fragments, three specimens represent flat bases and two disc bases. No. 983 with a flat base and no. 986 with a disc base have an applied slurry.

The one specimen of Grey ware (no. 972) is a rim fragment of a Bowl which is finished by streak burnishing.

[Pit no. 38] (Figure 4.77)

Among the 12 Red ware sherds, nine specimens of Pots, one Bowl and two base fragments are included.

The single specimen with its rim intact is Rim Type 1. It belongs to the RD Class 3 and the NH/RD Class 2. In terns of body shapes, nos. 990 and 993 are elliptical.

For Pots, seven specimens are painted and two are unpainted. Of the painted ones, six are monochrome and one is polychrome. Two specimens with discernible rim-neck patterns belong to Pattern 2. Of the three specimens with the body painting patterns, two represent Pattern 1 and one exhibits Pattern 2. In no. 989, a part of a circle in black is intact. It has an applied slurry. On no. 990, a horizontal black band is painted on the shoulder, above which is slipped in white and below which is a red slip.

Three specimens are adorned with parallel grooves, all of which are Pattern 1. No. 995 has polychrome paintings executed in white over a black-painted surface. In no. 994 a horizontal band is painted over parallel grooves.

One Bowl (no. 998) is painted with a narrow black band on the rim and semicircles on the internal side of the rim.

[Pit no. 38A] (Figures 4.78 - 4.80, 4.217 - 224)

Of the 54 potsherds, 50 are of Red ware and four specimens are of Grey ware. Of the Red ware, 33 specimens are Pots, 10 are Bowls, seven are base fragments and two are handle fragments. The specimens of the Grey ware include three Bowls and one body fragment of a Pot or a Bowl.

Thirteen specimens of Pots that have intact rims consist of 12 Rim Type 1 and one Rim Type 3. They are distributed in the RD Classes 2 to 6, among which Classes 2 to 4 dominate in number. In the NH/RD Classes, Classes 1 to 4 are represented, though Classes 1 to 3 are dominantly included. In terms of Shapes, no. 1011 has a short neck and a squat globular body. No. 1003 seems likely to have had a very short neck and an elliptical body. A luted edge from the manufacture of the rim can be observed on the upper edge of the sherd. On no. 1034, the neck is splayed out and is covered by an applied slurry. Nos. 1014, 1013 and 1029 exhibit a globular body with a lower centre of gravity, nos. 1008 and 1027 are globular, no. 1015 is long elliptical and no. 1028 is elliptical.

For Pots, 26 specimens are painted and seven are unpainted. Of the painted ones, 24 specimens are monochrome and two are of polychrome paintings. Of the 12 specimens that have discernible rim-neck painting, seven represent Pattern 1, four Pattern 2 and one Pattern 3. In no. 1015, parallel bands are painted

in a wide area of the body. No. 1002 is painted with a band on the upper part of the rim-neck portion and parallel bands on the lower part of the neck. No. 1021 exhibits a wide band under parallel narrow bands. on no. 1016, parallel bands and wavy bands are alternately arranged. On no. 1019 parallel bands are painted under a wavy band. No. 1018 has a wide oblique band and a thin curvilinear stroke.

Of the polychrome examples, no. 1014 is painted with a pipal leaf with a black outline and a white filling. In no. 1017 which represents parallel bands and a wavy band, white dots are painted in a wavy band.

Six specimens are incised with parallel grooves, among which five represent Pattern 1 and one Pattern 2. Of the Pattern 1 examples, 1028 has a ledge at the juncture between the neck and the body. Three parallel bands are painted on the shoulder and grooves are executed under the bands. On nos. 1023 and 1024, a horizontal band is painted over the grooved surface. On no. 1026, a part of lenticular stroke is intact. No. 1027 of Pattern 2 is painted with wide black band on the neck.

In Bowls, Types 1, 4, 5, 6 and 12 are identified. Seven specimens are painted with a narrow black band on the rim. Nos. 1040, 1041 and 1042 are painted with semicircles on the internal side of the rim.

Of the five specimens of base fragments, four are flat bases and one is a disc base. On two flat bases, a slurry is applied to the surface.

Of two fragments of handles, no. 1043 is a body sherd with a part of a handle intact on the body. No. 1044 has a rectangular section.

Of the Grey ware Bowls, no. 1036 has a rim thickened on the internal side and no. 1032 shows a gently out-curved neck. No. 1045 is a body fragment of a Pot or a Bowl. These specimens are all executed with streak burnishing. No. 1048 is a fragment of a flat base.

[Pit no. 39] (Figure 4.81)

Of the 14 specimens of Red ware, seven are Pots, two are Bowls, four are base fragments and one is a handle fragment.

In the two specimens of Pots with their rims intact, one each represents Rim Types 1 and 2. They are distributed in the RD Classes 4 and 5 and in the NH/RD Class 2.

Three specimens are monochrome and four are unpainted. Only two specimens have discernible rim-neck painting, one each in Patterns 2 and 3. One specimen exhibits a body painting pattern of Pattern 2. On no. 1053, black paintings are observed over the rim and the neck, although the stroke on the neck is likely to be unintentional. No. 1054 exhibits a black band on the upper part of the rim-neck portion. On no. 1056, wavy bands and parallel bands are alternately arranged.

Two specimens are adorned with parallel grooves, among which one specimen (no. 1059) represents Pattern 1 and another (no. 1058) shows Pattern 3.

For Bowls, Types 4 and 8 are represented respectively by one specimen each. As for Type 8, no. 1261 is painted with parallel vertical strokes in a horizontal register which is demarcated by parallel horizontal bands.

For the base fragments, three specimens are flat bases and one is a disc base. One handle fragment (no. 1060) is intact with a part of the handle attached to the body.

[Pit no. 40] (Figures 4.82 - 4.84)

Fifty-one specimens of Red ware were recovered from this pit, among which 36 Pots, 10 Bowls and five base fragments are represented.

Of the eight specimens with their rims intact, four represent Rim Type 1 and two each Rim Types 2 and 3. In the RD Classes, Class 3 is dominant while they are distributed in Classes 3 and 5. In the NH/RD Classes, they show a distribution across Classes 1 to 4, although Classes 1 and 2 dominate. In terms of shapes, no. 1071 is distinguished by a prominently out-curved neck. On no. 1070, a gently out-curved neck is accompanied with a slightly thickened rim with a

ridge on its external side. On nos. 1079 and 1083, a ledge is found at the juncture between the neck and the body. No. 1114 consists of a globular body and an inturned neck with a ledge between the neck and the body. No. 1077 exhibits a globular body with a lower centre of gravity. No. 288 is elliptical in shape. No. 1111 is distinguished by a sharp carination, although it may represent a Bowl. Nos. 1095, 1098, 1099 and 1100 have an applied slurry.

Of the Pots, 28 have monochrome paintings and eight are unpainted. Of the 11 specimens with discernible rim-neck painting, 10 specimens represent Pattern 1 and three Pattern 3. Four specimens have body paintings that all belong to Pattern 1. In no. 1079, parallel curvilinear bands are painted on the body. It may be a part of concentric semicircles. no. 1080 is painted with a wide band on the neck, and parallel bands and a wavy band on the shoulder. In no. 1087, slurry is applied beneath parallel bands on the shoulder. In nos. 1076 and 1085, a part of a large curvilinear stroke is intact, possibly representing a horn-like motif. In no.1083, parallel bands are painted in black over a white slip on the neck and the shoulder. The painted motifs on nos. 1081, 1088 and 1087 are indeterminate due to their limited preservation.

In the six specimens with parallel grooves, five represent Pattern 1 and one Pattern 2. In nos. 1094 and 1091 of Pattern 1, a part of some motif that is painted widely on the body is intact. In no. 1093, the portion below the shoulder is painted over in black. This fragment may represent the lower part of the body.

Three specimens are borne with post-firing graffiti. In no. 1096, a pattern with oblique lines is observed on its internal side. In no. 1075 a portion of post-firing graffiti is intact, although its entire pattern is indiscernible. On no. 1090, oblique lines in irregular directions are executed over a grooved surface.

For Bowls, Types 1, 2, 3 and 5 were identified, among which Type 5 is dominant. Nos. 1110, 1106 and 1109 of Type 5 are identical in shapes, having sharp carinations on the body and out-curved necks. The rim is thickened with a slightly projecting edge. All specimens of Bowls are painted with a narrow black band on the rim. On no. 1106, semicircles are painted on the internal side of the rim. On no. 1105, multiple loops are painted on its internal side. On no. 1101, an oblique stroke occurs in the same as that of nos. 1106 and 1105.

Of the base fragments, three are flat bases, one a disc base and one a ring base. On no. 1112, incised lines in a zigzag pattern are executed in a pre-firing condition.

[Pit no. 43] (Figures 4.85 - 4.86)

Among 18 potsherds recovered from this pit, 15 are Red ware and three specimens are of the Grey ware. In the Red ware, 10 specimens are Pots, four are Bowls and one is a Dish-on-Stand. Of the Grey ware, two specimens are Pots and one is a Bowl.

Of the Red ware Pots, seven specimens have intact rims representing Rim Type 1. They are distributed in RD Classes 3 to 7. In the NH/RD Classes, Classes 1 and 2 are indicated. In terms of shapes, no. 1122is likely to be elliptical. No. 1126 has a ledge at the juncture between the neck and the body.

Nine specimens are painted and one is unpainted. The painted ones are monochrome. In seven specimens with identifiable rim-neck painting, two specimens represent Pattern 1, four Pattern 2 and one Pattern 3. Only one specimen exhibits Pattern 1of the body painting pattern. On no. 1126, a wide band is painted on the neck and a part of a curvilinear band is intact on the body. In nos. 1127 and 1128, black paintings are executed with incised decorations.

Two specimens are adorned with incised decorations. No. 1127 exhibits hatched triangles made by incised lines and oblique black bands along the incised lines. Two rows of incised dots are arranged below the incised lines with a horizontal band below the dots. In no. 1128 a black band and incised lines are executed, although their entire composition is uncertain.

For Bowls, Types 1, 4 and 10 are represented. On two specimens, a narrow black band is painted on the rim. Two specimens of Type 10 (nos. 1135, 1136) are identical in shape, both executed with slurry.

The one Dish-on-Stand (no. 1130) is a fragment comprising the junction between the dish and the pedestal. On the external side of the base of the dish, irregular incised lines are executed probably for promoting the luting of the pedestal to the dish.

Of the Grey ware Pots, no. 1125 represents a rim-neck portion and no. 1129 is a body fragment with a vertical zigzag incised lines. The one specimen of a Bowl (no. 1133) has a gently out-curved neck painted with a narrow black band on the rim. It is finished by streak burnishing.

[Pit no. 44] (Figures 4.87 - 4.89, 4.225 - 4.228)

Of the 40 Red ware potsherds recovered from this pit, 24 specimens are Pots and 16 are base fragments.

Of the Pots, only two specimens have their rims intact. Both are Rim Type 1 and are in the RD Class 4 and the NH/RD Class 2. In terms of shapes, nos. 1141 and 1140 are elliptical. On nos. 1146, 1160, 1162 and 1159, a luted edge from the manufacturing process can be observed.

Of the Pots, 15 specimens are painted and nine are unpainted. The painted ones are all of monochrome. Eight specimens with identifiable rim-neck painting are of Pattern 1. Of the four specimens of with the body paintings, three represent Pattern 1 and one Pattern 2. On no. 1148, the painting motif cannot be identified due to its heavily rubbed-off surface. On no. 1154 only a part of painting motif is intact. On no. 1149, parallel bands are flanked by wavy bands.

One specimen with parallel grooves (no. 1155) belongs to Pattern 1. In one specimen with incised decorations (no. 1156), irregular incised lines in oblique directions are executed.

For the base fragments, 12 specimens represent flat bases, three disc bases and one a ring base. No. 1175 with a flat base has an applied slurry. No. 1165 exhibits mat impressions on the external side of the base. On no. 1176, one vertical incised line made post-firing occurs near the base.

[Pit no. 46] (Figure 4.90)

Ten specimens of Red ware were recovered from this pit, among which four Pots, four are Bowls and two are base fragments.

The single specimen with its rim intact exhibits Rim Type 1. It falls into the RD Class 4 and the NH/RD Class 2.

Two specimens of Pots are painted and two are unpainted. One of the painted is of monochrome and the other polychrome. Two specimens with identifiable rim-neck paintings include one each in Patterns 1 and 3. One specimen with body paintings is of Pattern 4. No. 1180 is painted with a wide band on the neck and parallel bands on the shoulder. A white slip is executed above the shoulder bands and a red slip is exposed below the bands. On the body are polychrome paintings, but its motif is unclear.

One specimen with parallel grooves (no. 1182) belongs to Pattern 2. In another specimen with incised decorations (no. 1181), parallel oblique lines are arranged at different angles.

For Bowls, Types, 1, 2 and 4 are identified. All specimens are painted with a narrow black band on the rim. Parallel vertical strokes on no. 1184 and parallel oblique strokes on no. 1181 are painted on the internal side of the rims.

The two base fragments represent a disc base and a ring base.

[Pit no. 49] (Figure 4.91)

Only two potsherds were found in this pit. One specimen represents a Pot and the other a base fragment. The Pot (no. 1189) is a rim sherd of Rim Type 1 and RD Class 4. The base fragment (no. 1190) exhibits a disc base.

[Pit no. 50] (Figure 4.92)

Twenty-seven potsherds were found in this pit,

among which 26 specimens are Red ware and one Grey ware. Of the Red ware, 11 specimens are Pots, six specimens are Bowls, eight specimens are base fragments and one specimen is a Spouted Vessel. The Grey ware specimen is a Bowl.

Of Red ware Pots, eight specimens have intact rims among which seven are Rim Type 1 and one is Rim Type 2. They are distributed in the RD Classes 2 to 5 and the NH/RD Classes 1 to 4. In the NH/RD Classes, Classes 1 and 2 are dominant, while only one specimen is included in Class 4. In terms of shapes, no. 1193 has a projecting rim with a rectangular section. On no. 1202, a luted edge from the manufacturing process can be observed.

Ten specimens of Pots are painted and one is unpainted. Of the painted ones, nine specimens are monochrome and one is polychrome. Of the six specimens with identifiable rim-neck paintings, one specimen represents Pattern 1 and five s Pattern 2. One specimen has body painting of Pattern 2. In no. 1124, a parallel bands are combined with a gentle wavy band.

In one polychrome (no. 1200), two sets of a black outlines with white fillings.

For Bowls, Types 1, 4 and 6 are represented. Among them Type 1 is dominant. Three Bowls are painted with a narrow black band on the rim. On no. 1209, a black band covers a wide area of the neck and body portions. On nos. 1205 and 1206, semicircles are painted on the internal side of the rim. Multiple loops occurs on no. 1204.

The base fragments are all flat bases, among which two have an applied slurry.

As described above (p. 61), one specimen of a Spouted Vessel (no. 974) is a body fragment with a perforation. A part of a spout may be indicated by ridged clay parts.

Of the Grey ware, no. 1208 is a body fragment of a Bowl having a carination. It is streak burnished.

[Pit no. 100] (Figure 4.93 - 4.94, 4.229 - 4.235)

Of the 61 potsherds, 59 are Red ware and two are Grey ware. Of the Red ware, 41 specimens are Pots, six are Bowls, 11 are base fragments and one specimen is a Dish-on-Stand. Of the Grey ware, one specimen represents a Dish-on-Stand and theother a body fragment of a Pot or a Bowl.

Of Red ware Pots, eight specimens have intact rims, among which four belong to Rim Type 1 and four to Rim Type 2. They show distributions in the RD Classes 3 to 5 and the NH/RD Classes 1 and 2. In terms of shapes, no. 1223 has a projecting rim with a rounded section. No. 1220 is distinguished by its rim with a triangular section and ridged neck. In nos. 1243, 1244, 1228, 1226, 1250 and 1249, the body is elliptical. Nos. 1245 and 1235 have a globular body with a lower centre of gravity. No. 1232 appears to have had a long elliptical shape. Nos. 1226, 1227 and 1251 have a ledge at the juncture between the neck and the body.

Of the Pots, 29 specimens are painted and 12 are unpainted. All of the painted ones are monochrome. Of the eight specimens that have identifiable rim-neck paintings, four are of Pattern 1, one of Pattern 2 and three of Pattern 3. The 14 specimens with body paintings include nine specimens of Pattern 1, one of Pattern 2, one of Pattern 3 and three of Pattern 4. Nos. 1243, 1244 and 1235 exhibit plant motifs. On no. 1243, a plant motif consisting of a central axis with short parallel oblique strokes is painted independently. On no. 1244, a horizontal band is delineated above the plant motif. No. 1235 shows a plant motif between two horizontal bands on the neck and the body. On no. 1245, hatched triangles are painted between horizontal bands on the neck and the body. Post-firing graffiti can be identified over the lower horizontal band. In nos. 1239, 1240 and 1233, parallel bands and wavy bands are alternately arranged. On no. 1232, parallel bands are arranged over a wide area of the body. Nos. 1236 and 1181 have a slurry below a horizontal band.

The 12 specimens are adorned with parallel grooves, among which seven represent Pattern 1 and five Pattern 2. On Pattern 1, no. 1251 has a ledge at

the juncture between the neck and the body and is painted with a wide band on the neck and parallel bands on the shoulder, below which parallel grooves are executed. On nos. 1255 and 1256, a wide band is painted over the grooved surface. On no. 1254 two parallel bands are delineated. Of Pattern 2, no. 1250 is painted with a wide band on the neck and parallel bands on the shoulder. Two sets of parallel grooves are delineated on the shoulder and the body, between which wavy grooves are executed in two sets. A wavy groove is observed below the straight grooves on the body as well. No. 1249 shows more than two sets of wavy grooves flanking a set of straight grooves. Similarly, a part of two sets of wavy grooves flank a set of straight grooves on no. 1248.

Only one specimen is adorned with incised decorations probably representing a vertical zigzag pattern.

Of Bowls, Types 1, 5 and 9 are represented, among which Type 5 dominates. All specimens are painted with a narrow black band on the rim. Semicircles on no. 1201 and intersecting loops on no. 1261 are painted on the internal side of the rims.

For base fragments, four specimens represent flat bases, three disc bases and four ring bases. Two specimens of flat bases (nos. 1275, 1278) and one of the ring bases (no. 1271) have an applied slurry.

Of the Grey ware, one specimen (no. 1267) is a fragment of a pedestal of a Dish-on-Stand. It has a splayed-out shape with a projecting rim and is entirely slipped in grey and finished by streak burnishing. No. 1259 is a body fragment exhibiting a luted edge from the manufacturing process. It is streak burnished on its external surface. A black patch is observed on its external side.

[Trench 13] (Figure 4.95)

Of the 13 specimens of Red ware, nine specimens represent Pots, three Bowls and one a base fragment.

Of the Pots, three specimens have intact rims of Rim Type 1. They occur in the RD Classes 3 and 4 and in the NH/RD Classes 1 and 2.

Seven specimens of Pots are painted monochrome and two are polychrome paintings. In two specimens with discernible rim-neck paintings, one each represents Patterns 1 and 3. In four specimens with the body paintings, three are of Pattern 2 and one of Pattern 1. No. 1281 is painted with three wavy bands in a space demarcated by parallel straight bands. No. 1282 is likely to have a similar pattern. On no. 1280, parallel bands cover a wide area of the body.

The one specimen with parallel grooves exhibits Pattern 1 and has a part of curvilinear stroke in black over a grooved surface.

One specimen with incised decorations (no. 1290) has an intact rim-neck portion showing a row of incised dots and incised lines in a vertical zigzag pattern. In no. 1291 incised lines in a vertical zigzag pattern are intact.

For Bowls, Types 1, 10 and 11 are represented. Two specimens are painted with a narrow black band on the rim.

One specimen of a base fragment (no. 1289) represents a flat base.

[Trench 19] (Figures 4.96 - 4.98, 4.236- 243)

Fifty potsherds were recovered from the occupational layer in this trench, among which 48 specimens are Red ware and two are Grey ware. Of the Red ware, 29 specimens of Pots, nine Bowls, eight base fragments, one Dish-on-Stand and one handle fragment are represented. Two specimens of Grey ware are Bowls.

16 Red ware Pots have intact rims that exhibit Rim Type 1. In the RD Classes, one specimen indicates Class 1, while the rest are distributed in Classes 3 to 5. In the NH/RD Classes, Classes 1 and 2 are dominant in number whereas a few occur in Classes 3 and 4. In terms of shapes, no. 1292 has a tall neck. No. 1326 has an elliptical body. No. 1325 is distinguished by its prominently out-curved neck.

20 of the Pots are painted and nine are unpainted. Among the painted ones, 16 are monochrome and four are polychrome. Of 11 specimens with rim-

neck paintings, three specimens are of Pattern 1 and eight are of Pattern 2. In four specimens with body paintings, one represents Pattern 1, two Pattern 2 and one Pattern 4. On no. 1331, two sets of parallel bands delineate a register, in which a parallel oblique strokes of different angles and circles are filled. On no. 1330, parallel bands are arranged below more than three wavy bands. No. 1298 is painted with semicircles on the internal side of the rim. On no. 1292, two wide bands cover the rim-neck portion, and parallel and wavy bands are painted on the shoulder.

Of the polychrome, no. 1304 exhibits lenticular outlines in black with a white filling inside them. No. 1305 shows a similar pattern that consists of lenticular black outlines with a red stroke inside them. On no. 1332, a white colour fills the inside of a pair of vertical strokes in black. On no. 1334 a white band is delineated on a red-slipped surface.

Two specimens are adorned with parallel grooves, one Pattern 1 (no. 1336) and another Pattern 2 (no. 1335). One specimen with incised decorations (no. 1293) exhibits oblique incised lines and curvilinear lines, although its entire pattern is unclear.

Of the Bowls, Types 1, 4 and 6 were identified, among which Types 1 and 6 are dominant. On four specimens, the rim is painted with a narrow black band. No. 1310 is painted with semicircles on the internal side of the rim. No. 1311 is distinguished by its shallow shape.

Of the base fragments, seven specimens represent flat bases and one a disc base. The one specimen with a flat base has an applied slurry.

The one specimen of a Dish-on-Stand (no. 1339) is a fragment of the pedestal that has a slightly projecting rim. Black bands are painted on the rim and the body.

One handle fragment (no. 1306) has an oblong section.

Of the Grey ware, all are represented by Bowls. No. 1317 has a globular body with a short neck. No. 1312 is distinguished by a gently out-curved neck. Both specimens are finished by streak burnishing.

[Trench 31] (Figures 4.99, 4.244)

Three specimens of Red ware fragments were found in this pit, all represent body fragments of Pots. No. 1342 has a globular body that is painted with a wide band on the shoulder and parallel bands on the body. On no. 1343, the neck is covered by a wide black band with parallel bands and a wavy band painted on the shoulder. It has a ledge at the juncture between the neck and the body. It may have had a tall neck. On no. 1344, parallel bands and wavy bands are alternately arranged.

[Trench 37] (Figure 4.100)

Of the 12 specimens of Red ware recovered from this trench, three represent Rim Type 1 and one Rim Type 2. They are distributed in the RD Classes 3 and 4 and in the NH/RD Class 3.

In Pots, seven specimens are painted and one is unpainted. Among the painted ones, six are monochrome and one polychrome. Of the five specimens with their rim-neck paintings, three are of Pattern 1, one of Pattern 2 and one of Pattern 3. The only one specimen with body paintings is Pattern 4. On no. 1347 which has a projecting rim. A white slip is applied on the internal side of the rim and the entire external side and with a relatively wider band over the rim and the upper part of the neck. On no. 1351, oblique strokes in black are irregularly painted. No. 1349, which has a wide black band from the rim to the body, has a part of post-firing graffiti.

On no. 1352, which has parallel grooves, parallel bands in white and black are painted on the shoulder, below which the grooves are executed. A part of the paintings is intact on the body, although its entire pattern is uncertain.

One specimen with incised decorations (no. 1350) exhibits a zigzag pattern.

For the Bowls, Types 1 and 5 are represented. No. 1354 of Type 1 is distinguished by a sharply carinated body and overturned rim. The entire external surface is painted in black. All specimens of Bowls are finished by streak burnishing.

Of the base fragments, one specimen represents a flat base and another a ring base.

6 CONCLUSION

Based on the observations and discussions above, the following points can be summarized as a conclusion.

1) Excavations unearthed potsherds from a number of pits. Throughout different pits, an assemblage dominated by Red ware with a subsidiary amount of Grey ware was observed. For the Red ware, paintings, parallel grooves and incised decorations are the distinctive traits used to characterize the assemblage. Grey ware is dominantly represented by plain ware.

2) In terms of shapes, Red ware is dominated by Pots followed by Bowls. A few Dish-on-stands and a Spouted Vessel were identified. As for the Grey ware, Bowls are dominant in number with a few specimens of Pots and Dish-on-Stands.

Among the Red ware, Pots are dominated by short necks and simple rounded rims, although some specimens exhibit tall necks and projecting rims. In terms of body shapes, globular, elliptical and carinated shapes are observed, among which simple globular and elliptical forms are dominant.

As for Bowls, various forms are dominated by an out-curved and straight necks. A few specimens exhibit inturned necks. In terms of their body shapes, hemispherical, shallow hemispherical, globular and carinated ones are represented.

Regarding Dish-on-Stands, only pedestal fragments were identified.

For Grey ware, Bowls and Dish-on-Stands are represented by shapes similar to those of the Red ware. No specimens of Pots were complete enough to give anindication as to their overall shapes.

3) As for paintings, the rim-neck portions are variously painted with bands, i.e. those painted with a wide band from the rim to the body, those with rim-neck bands, and those only with narrow bands on the rim. The latter two groups are also painted on the body in some specimens. Regarding body painting patterns, parallel bands are the dominant motifs, combined with wavy bands and some motifs that are painted widely across the body.

As for those motifs widely painted on the body, pipal leaf and horn-like motifs are identified, although in most of specimens the entire motif is not preserved. These motifs may be comparable with those in western Punjab and Balochistan indicating some inter-regional interaction among these regions.

The polychrome paintings is also a key to see the relations with the west. The Gomal, Bannu and western Punjab are characterized by polychrome paintings on pottery during the 4th millennnium BCE. It is quite likely that the Ghaggar Basin may have been related to this ceramic tradition in the west.

4) On parallel grooved specimens, three patterns are discernible, i.e. one only with parallel straight grooves, the second with straight and wavy grooves, and the third with wider grooves that are both straight and wavy.

The first type of grooved pottery is similar to Kot Diji pottery of the western Punjab and the Gomal-Bannu region (Allchin *et al.* 1986; Dani 1970-71; Halim 1972; Khan *et al.* 1991; Mughal 1974, 1997; Wheeler 1947). A manufacturing technique using only rotation is also commonly attested on grooved pottery at Girawad and the comparable type of pottery from the western Punjab. Their elliptical body shapes may be another indicator of relations between the two regions.

The second type of grooved pottery is found in the Gomal region (Dani 1970-71) and in the Cholistan region (Mughal 1997). It may be noted that those from the Gomal region are also modelled using both rotational and non-rotational techniques, as is the case of those from Girawad (personal observation

by the author on the pottery from Gumla at Peshawar University Museum).

The third type may be comparable to those from the western Punjab and Balochistan (Dani 1970-71; Fairservis 1956). Even among Harappan pottery, the same type of groove decoration can be found on large Pots and Jars.

5) The incised pottery is dominated by a vertical zigzag pattern of incised lines, although the entire pattern is not identifiable. In a few specimens, incised lines are accompanied with rows of dots and appliqué bands. This type of incised pottery has been reported from Bhirrana in the Fatehabad District, Haryana.

6) In terms of manufacturing techniques, there were two groups identified, i.e. one using rotational technique only and another using both the rotational and non-rotational technique together. Along with these, streak burnishing technique is distinctively observed in a number of specimens. Among the body fragments are found a fair amount of fragments that retain luted edge resulting from the manufacturing process. These specimens exhibit that coil or slab construction techniques were used in the primary stage of modelling and then finished by rotational and non-rotational techniques. In the case of those using only rotational technique, the combination of these in the primary and secondary stages of modelling cannot be determined.

Furthermore the application of slurry is another distinctive trait that is observed in the Girawad pottery. Those with a thicker layer of slurry may indicate a similarity to Hakra pottery in Cholistan. However, it is noteworthy that the application of slurry, whether thin or thick, is commonly found not only on Hakra pottery but also on Kot Diji pottery, Tochi-Gomal pottery and even Harappan pottery.

7) In regards to the chronology of Girawad pottery, two AMS 14C dates have been obtained, indicating 4169 BC (22.4%) 4127 BC (1σ) (PLD-9495) and 2695 BC (46.9%) 2580 BC (1σ) (PLD-9494). However, these dates are not enough to fix the entire occupation of the site in time. In other words, two dates alone are not helpful in dating the Girawad pottery.

In terms of the ceramic evidence and the chronology, the similarities to Hakra and Kot Diji pottery may suggest some date in the fourth millennium BCE and the early third millennium BCE.

It should be noted that some similarities in shapes, manufacturing techniques and decorative traits can be found between the pottery specimens recovered from Girawad and those pottery from the Harappan level in the Settlement area at Farmana. Differences are also observed between the two, indicating the possibility that those from Girawad represent an aspect of local pottery in the pre- or Early Harappan period and that the local ceramic tradition continued into the Harappan period with some changes. In this regard, the ceramics from Girawad can be comparable with the Sothi-Siswal pottery identified in Haryana at the sites of Siswal and Mitathal.

Acknowledgments

I thank Prof. V. Shinde for giving me an opportunity to work on the pottery from Girawad. Dr. R.W. Law kindly read through the draft and gave me valuable suggestions.

References

Ali, T. ed. (1994-95) Excavations in the Gomal Valley: Rehman Dheri Report No.2. *Ancient Pakistan* 10: 1-233.

Allchin, F.R., B. Allchin, F.A. Durrani and M.Farid Khan (1986) *Lewan and the Bannu Basin: Excavation and Survey of sites and environments in North West Pakistan*. BAR International Series 310. Cambridge.

Bisht, R.S. (1982) "Excavations at Banawali: 1974-77", in G.L. Possehl (ed.) *Harappan Civilization: a Contemporary Perspective*. Oxford IBH and the American Institute of Indian Studies, New Delhi. pp. 113-124.

Bisht, R.S. and S. Asthana (1979) "Banawali and Some Other Recently Excavated Harappan Sites in India", in M. Taddei (ed.) *South Asian Archaeology 1977*. Istituto Universitario Orientale, Naples. pp. 225-240.

Dangi, V. (2009a) "Archaeology of the Ghaggar Basin: Settlement Archaeology of Meham Block, Rohtak, Haryana, India", in T. Osada and A. Uesugi (eds.) *Occasional Paper 8: Linguistics, Archaeology and the Human Past*. Indus Project, Research Institute for Humanity and Nature, Kyoto. pp.1-111.

Dangi, V. (2009b) "Recent exploration in the Chautang Basin (Jind District, Haryana)", in T. Osada and A. Uesugi (eds.) *Occasional Paper 9: Linguistics, Archaeology and the Human Past*. Kyoto. pp.73-163.

Dani, A.H. (1970-71) Excavations in the Gomal Valley. *Ancient Pakistan* 5: 1-117.

Dikshit, K.N. (1984) "The Sothi Complex: Old Records and Fresh Observations", in B.B. Lal and S.P. Gupta (eds.) *Frontiers of the Indus Civilization: Sir Mortimer Wheeler Commemoration Volume*. Indian Archaeological Society, New Delhi. pp.531-537.

Durrani, F.A. (1988) Excavations in the Gomal Valley: Rehman Dheri Excavation Report No.1. *Ancient Pakistan* 6: 1-232.

Durrani, F.A, I. Ali and G. Erdosy (1991) Further Excavation at Rehman Dheri. *Ancient Pakistan* 7: 61-151.

Durrani, F.A. and R.P. Wright (1992) "Excavation at Rehman Dheri: The Pottery Typology and Technology", in G.L. Possehl (ed.) *South Asian Archaeology Studies*. Oxford and IBH, New Delhi. pp.145-162.

Fairservis, W.A. (1959) Archaeological Surveys in the Zhob and Loralai Districts, West Pakistan. *Anthropological Papers of the American Museum of Natural History.* 47(2). The American Museum of Natural History, New York.

Halim, M.A. (1972b) Excavations at Sarai Khola, Part II. *Pakistan Archaeology* 8: 1-112.

Jarrige, C., J. -F. Jarrige, R.H. Meadow and G. Quivron (1995) *Mehrgarh: Field Reports 1974-1985 From Neolithic Times to the Indus Civilization*. The Department of Culture and Tourism, Government of Sindh, Pakistan, Karachi.

Jenkins, P.C. (1994) "Continuity and change in the ceramic sequence at Harappa", in A. Parpola and P. Koskikallio (eds.) *South Asian Archaeology 1993*. Suomalainen Tiedeakatemia, Helsinki. pp.315-328.

Joshi, J.P. (1993) *Exacavations at Bhagwanpura 1975-76 and Other Explorations & Excavations 1975-81 in Haryana, Jammu & Kashmir and Punjab*. Memoirs of the Archaeological Survey of India no.89. Archaeological Survey of India, New Delhi.

Kenoyer, J.M. and R.H. Meadow (2000) "The Ravi Phase: A New Cultural Manifestation at Harappa", in M. Taddei and G. De Marco (eds.) *South Asian Archaeology 1997*. Istituto Italiano per l'Africa e l'Oriente, Rome. pp.55-76.

Khan, F., Knox, J.R. and Thomas, K.D. (1991) *Explorations and Excavations in Bannu District, North-West Frontier Province, Pakistan, 1985-1988*. British Museum Occasional Paper No.80. Department of Oriental Antiquities, London.

Khan, F.A. (1965) Excavations at Kot Diji. *Pakistan Archaeology* 2: 13-85.

Khatri, J.S. and M. Acharya (1995) Kunal: A New Indus-Saraswati Site. Purātattva 25: 84-86.

Lal, B.B., J.P. Joshi, B.K. Thapar and Madhu Bala (2003) *Excavations at Kalibangan: The Early Harappans (1960-1969)*. Memoirs of the Archaeological Survey of India no.98. Archaeological Survey of India. New Delhi.

Meadow, R.H. and J.M. Kenoyer (1993) Excavation at Harappa - 1992 and 1993. *Pakistan Archaeology* 28: 55-102.

Mughal, M.R. (1970) *The Early Harappan Period in the Greater Indus Valley and Northern Baluchistan*. Unpublished Ph.D Dissertation. University of Pennsylvania, Philadelphia.

Mughal, M.R. (1974) New Evidence of the Early Harappan Culture from Jalilpur. *Archaeology* 27: 106-113.

Mughal, M.R. (1997) *Ancinet Cholistan: Archaeology and Architecture*. Ferozsons, Lahore.

Nath, A. (1998) Rakhigarhi: A Harappan Metropolis in the Sarasvati-Drishadvati Divide. Purātattva 28: 39-45.

Nath, A. (1999) Further Excavations at Rakhigarhi. *Purātattva* 29: 46-49.

Nath, A. (2001) Rakhigarhi: 1999-2000. *Purātattva* 31: 43-46.

Rao, L.S., Nandini, B. Sahu, Prabash Sahu, Samir Diwan and U.A. Shastry (2004) New Light on the Excavation of Harappan Settlement at Bhirrana. *Purātattva* 35: 60-68.

Rao, L.S., N.B. Sahu, Prabash Sahu, U.A. Shastry and Samir Diwan (2003) Unearthing Harappan Settlement at Bhirrana. *Purātattva* 34: 20-24.

Rao, L.S., N.B. Sahu, U.A. Shastry, Prabash Sahu and Samir Diwan (2005) Bhirrana Excavations 2005-06. *Purātattva* 36: 45-49.

Shinde, V., T. Osada, M.M. Sharma, A. Uesugi, T. Uno, H. Maemoku, P. Shirvalkar, S.S. Deshpande, A. Kulkarni,

A. Sarkar, A. Reddy, V. Rao and V. Dangi (2008) "Exploration in the Ghaggar Basin and excavations at Girawad, Farmana (Rohtak District) and Mitathal (Bhiwani District), Haryana, India", in T. Osada and A. Uesugi (eds.) *Occasional Paper 3: Linguistics, Archaeology and the Human Past*. Indus Project, Research Institute for Humanity and Nature, Kyoto. pp.77-158.

Suraj Bhan (1971-72) Siswal – a pre-Harappan site in Drisadvati valley. *Purātattva* 5: 44-46.

Suraj Bhan (1973) "The Sequence and Spread of Prehistoric Cultures in the Upper Sarasvati Basin", in D.P. Agrawal and A. Ghosh (ed.) *Radiocarbon and Indian Archaeology*. Tata Institute of Fundamental Research, Bombay. pp.252-263.

Suraj Bhan (1975) *Excavation at Mitathal (1968) and Other Explorations in the Sutlej-Yamuna Divide*. Kurukshetra University, Kurukshetra.

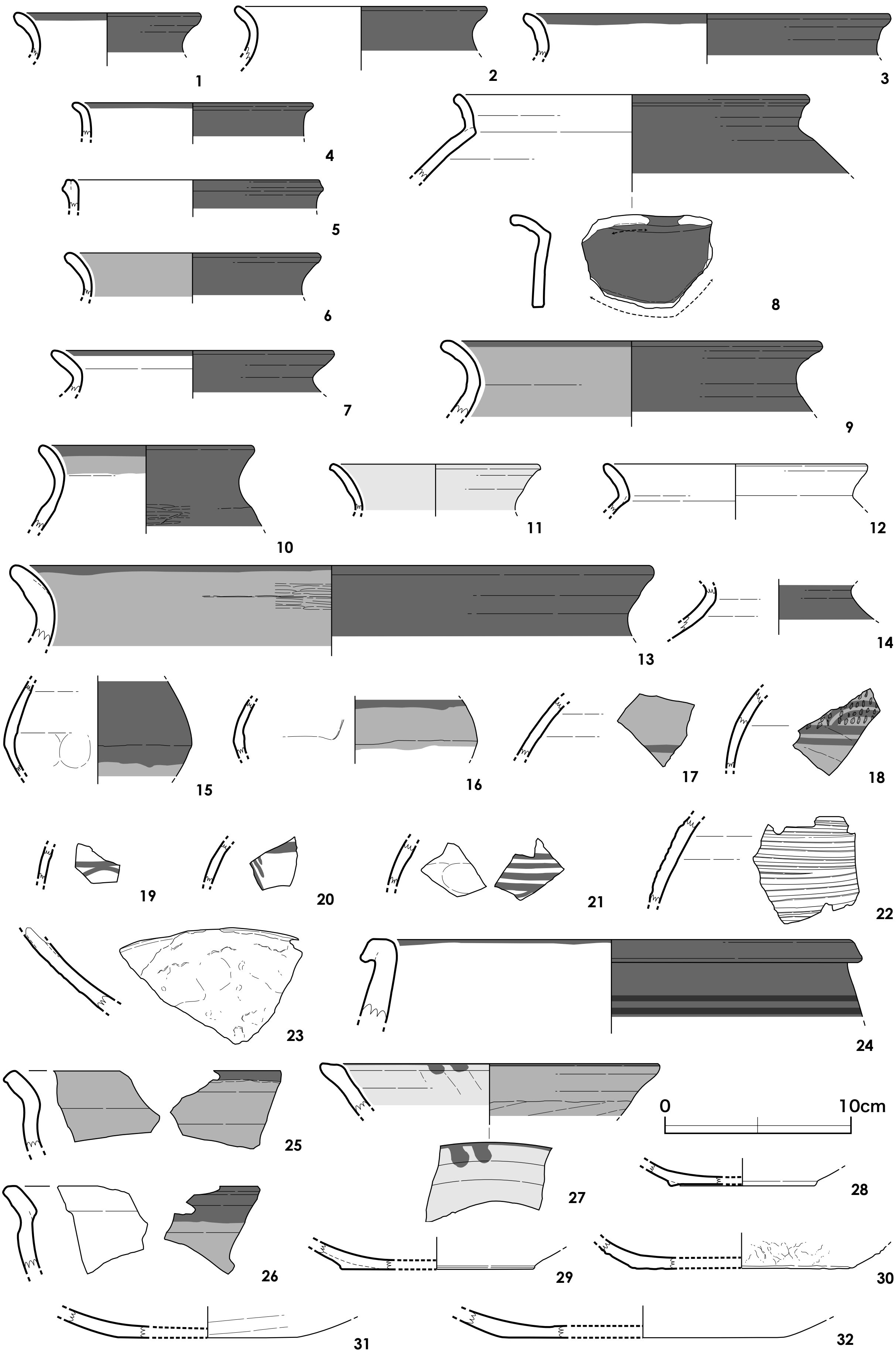


Figure 4.18   Pottery from Pit 1

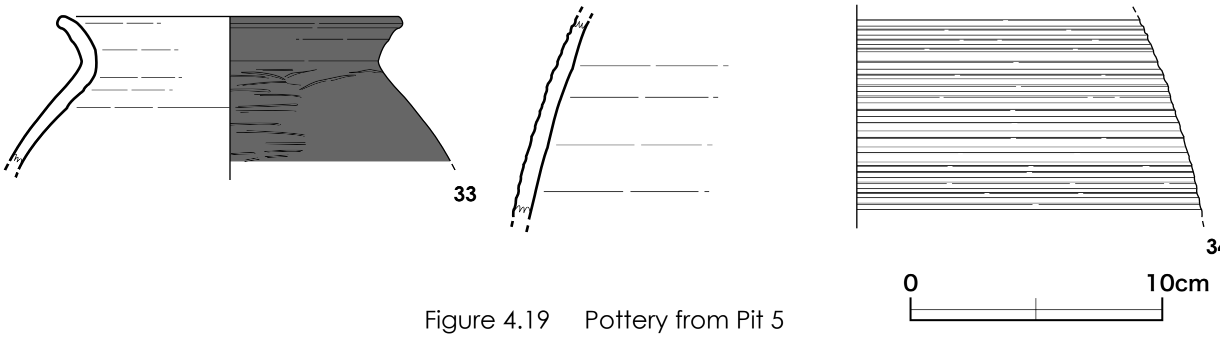


Figure 4.19 Pottery from Pit 5

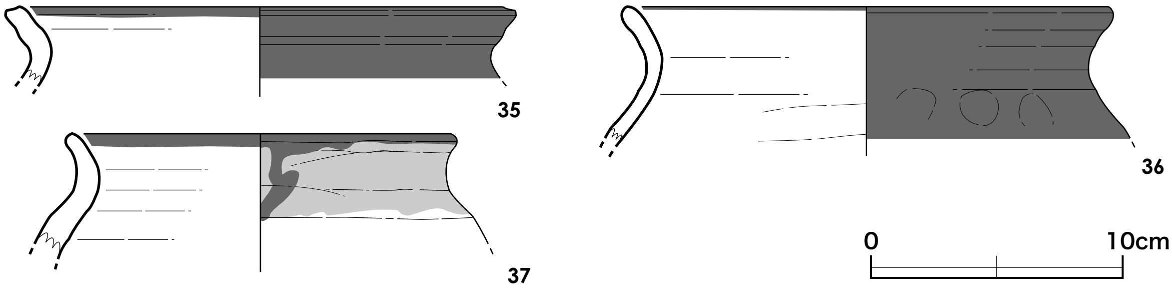


Figure 4.20 Pottery from Pit 6

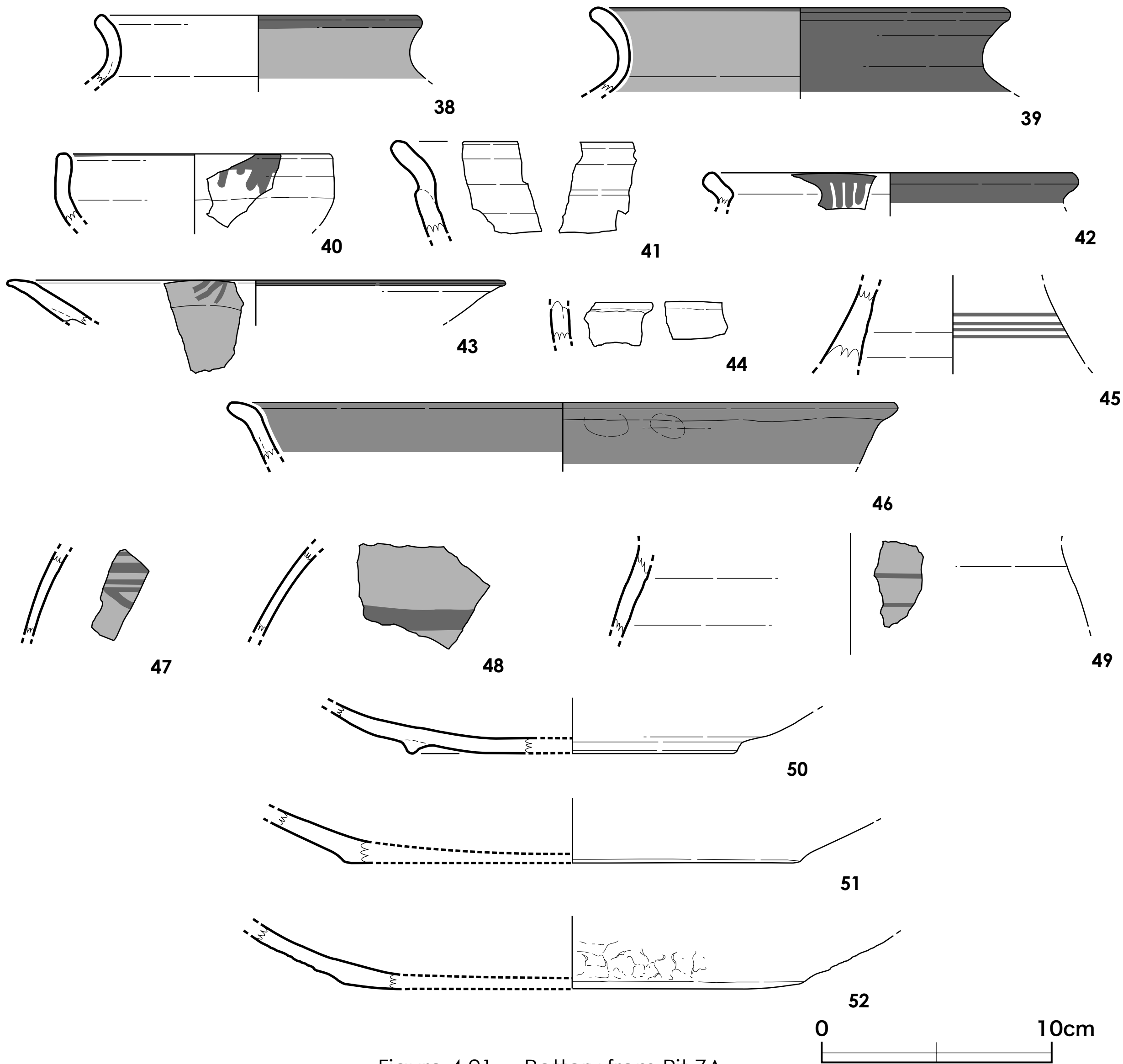


Figure 4.21 Pottery from Pit 7A

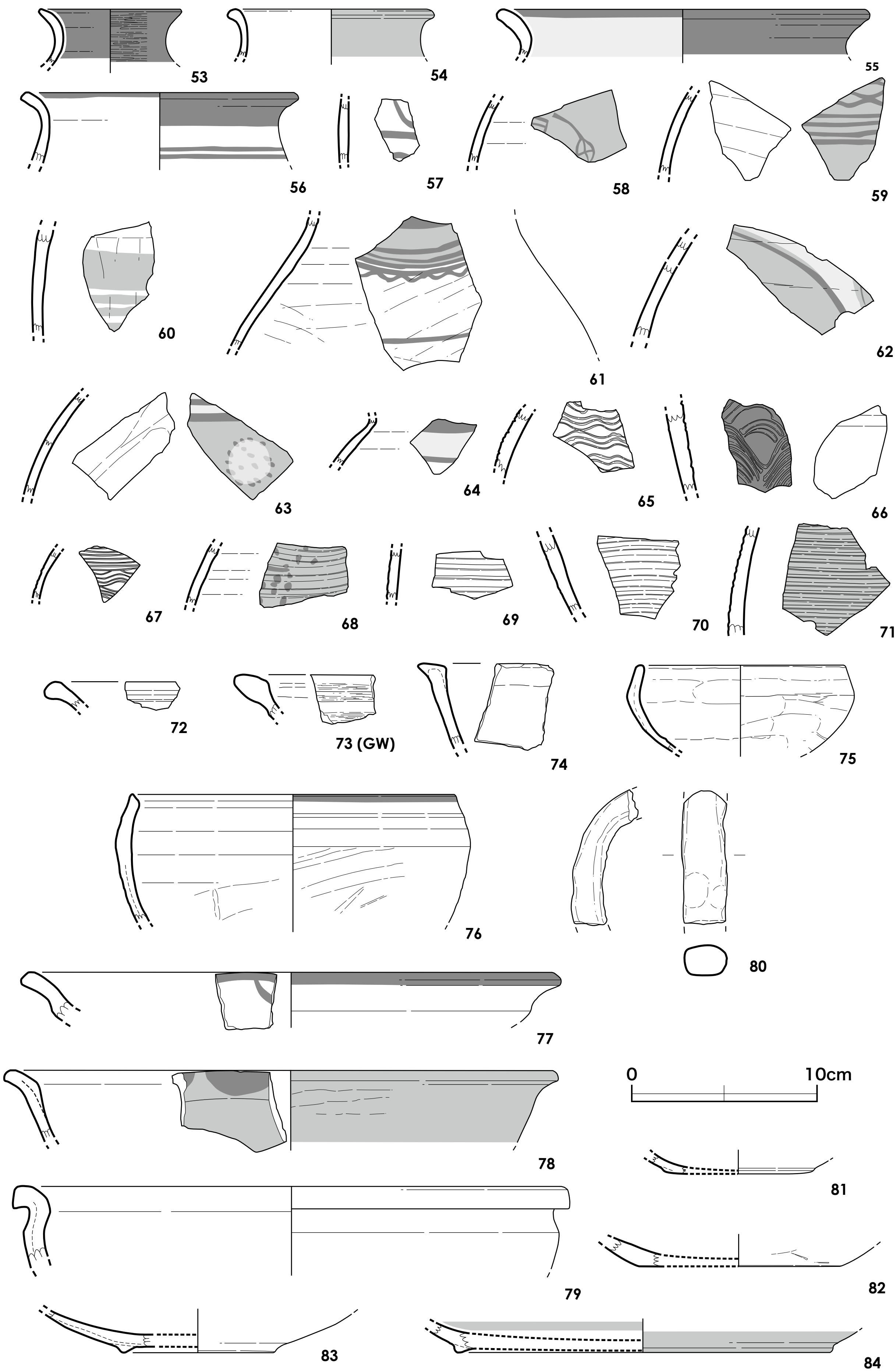


Figure 4.22 Pottery from Pit 8

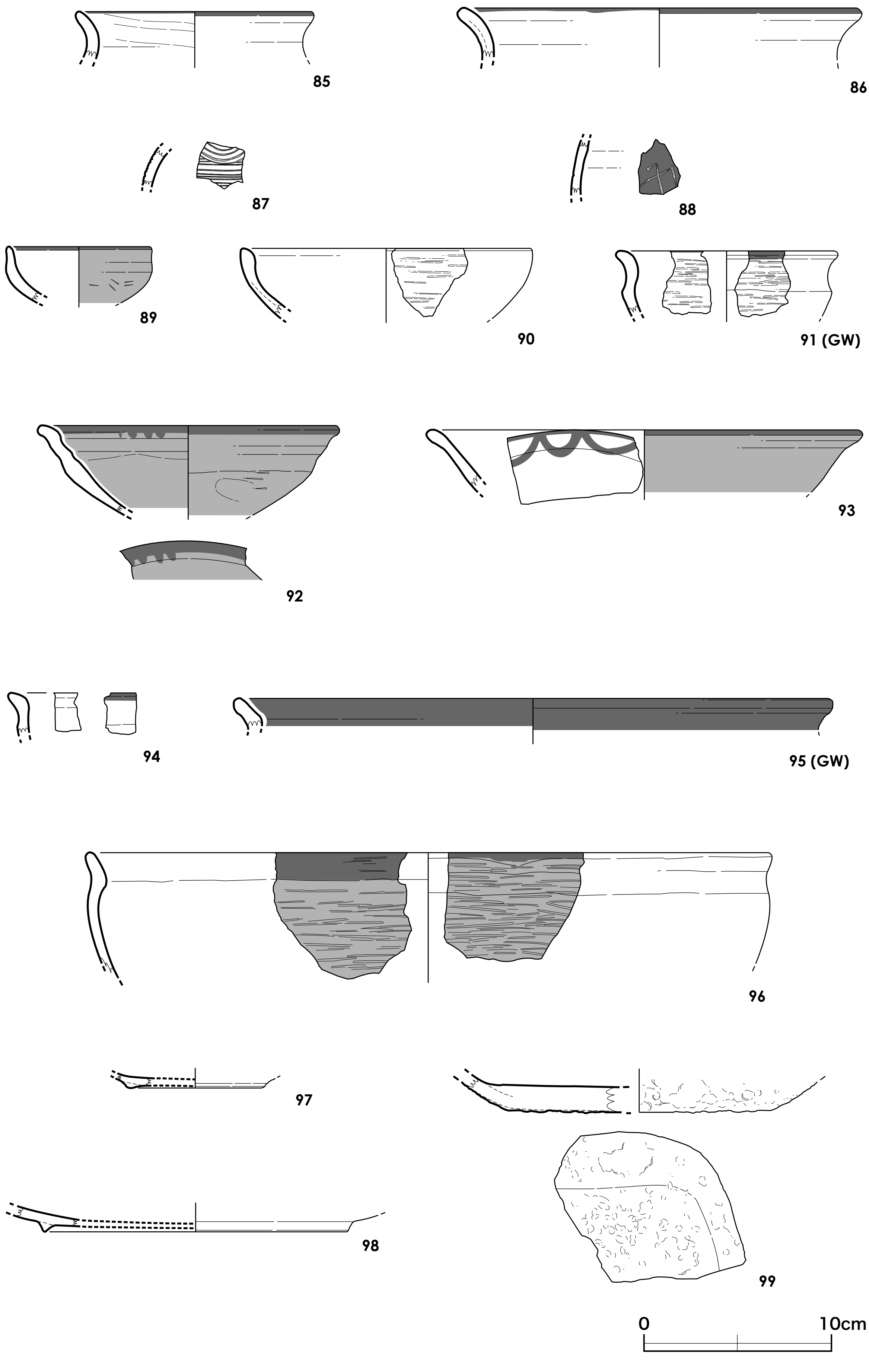


Figure 4.23 Pottery from Pit 8A

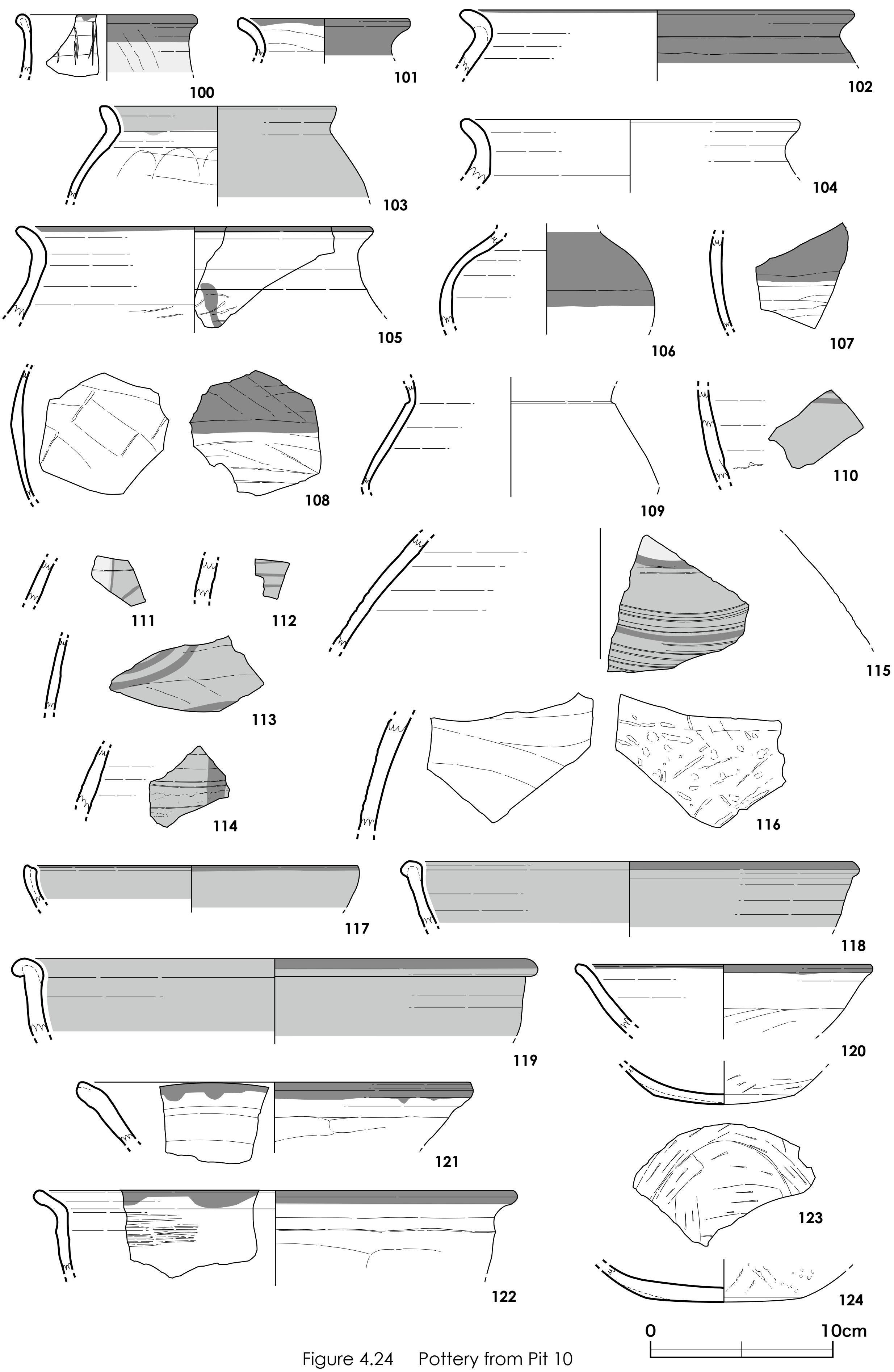


Figure 4.24 Pottery from Pit 10

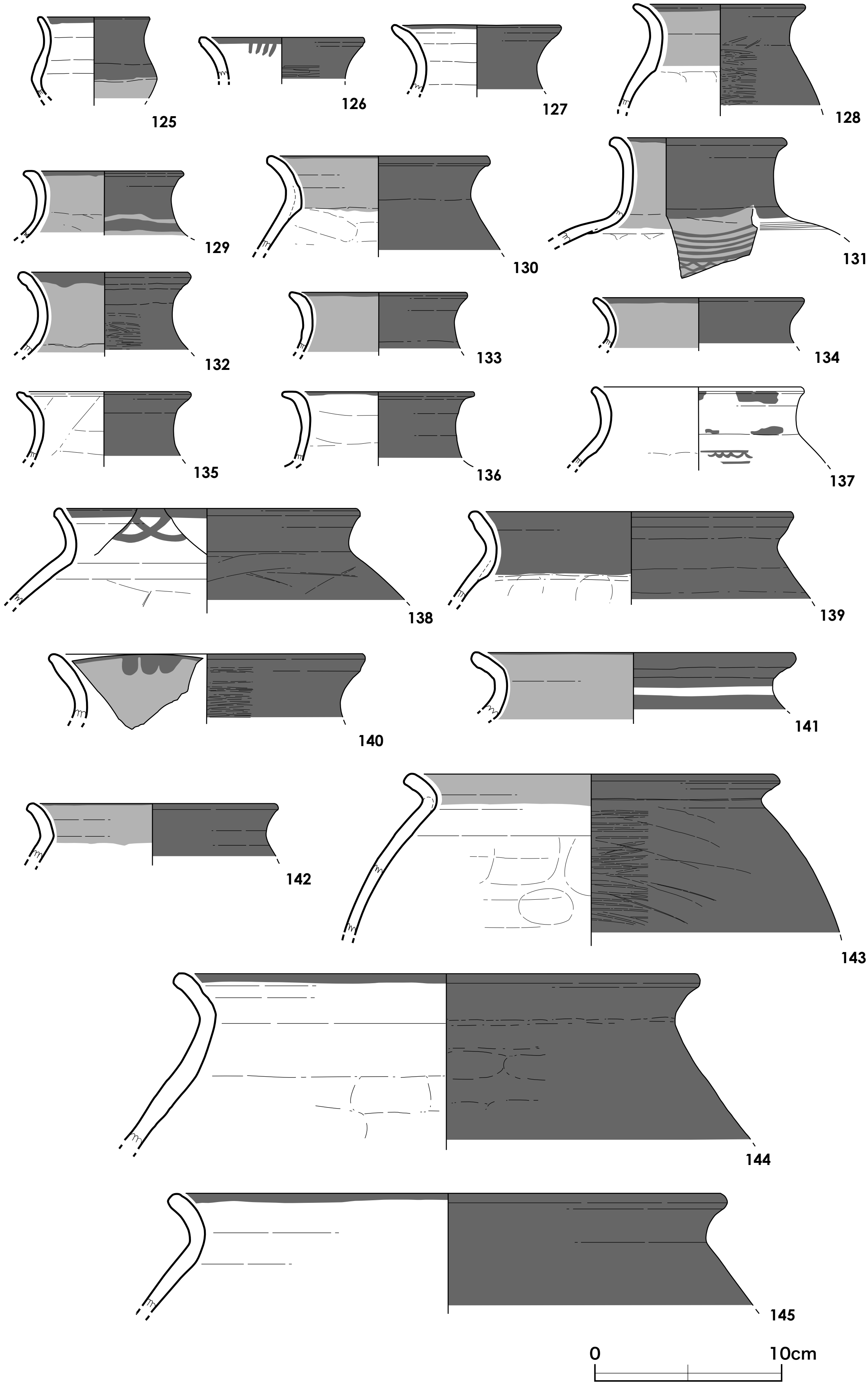


Figure 4.25 Pottery from Pit 11

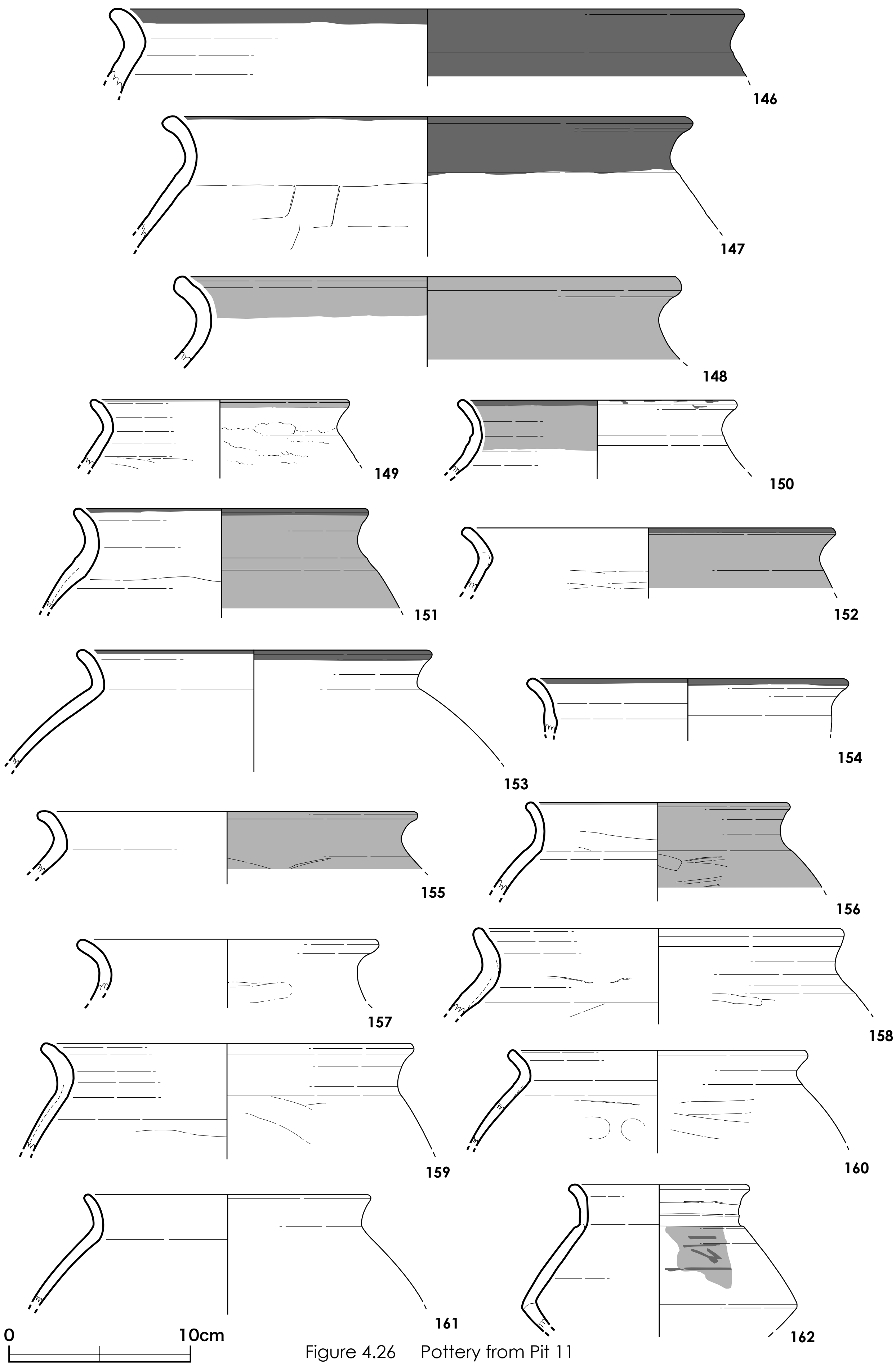


Figure 4.26   Pottery from Pit 11

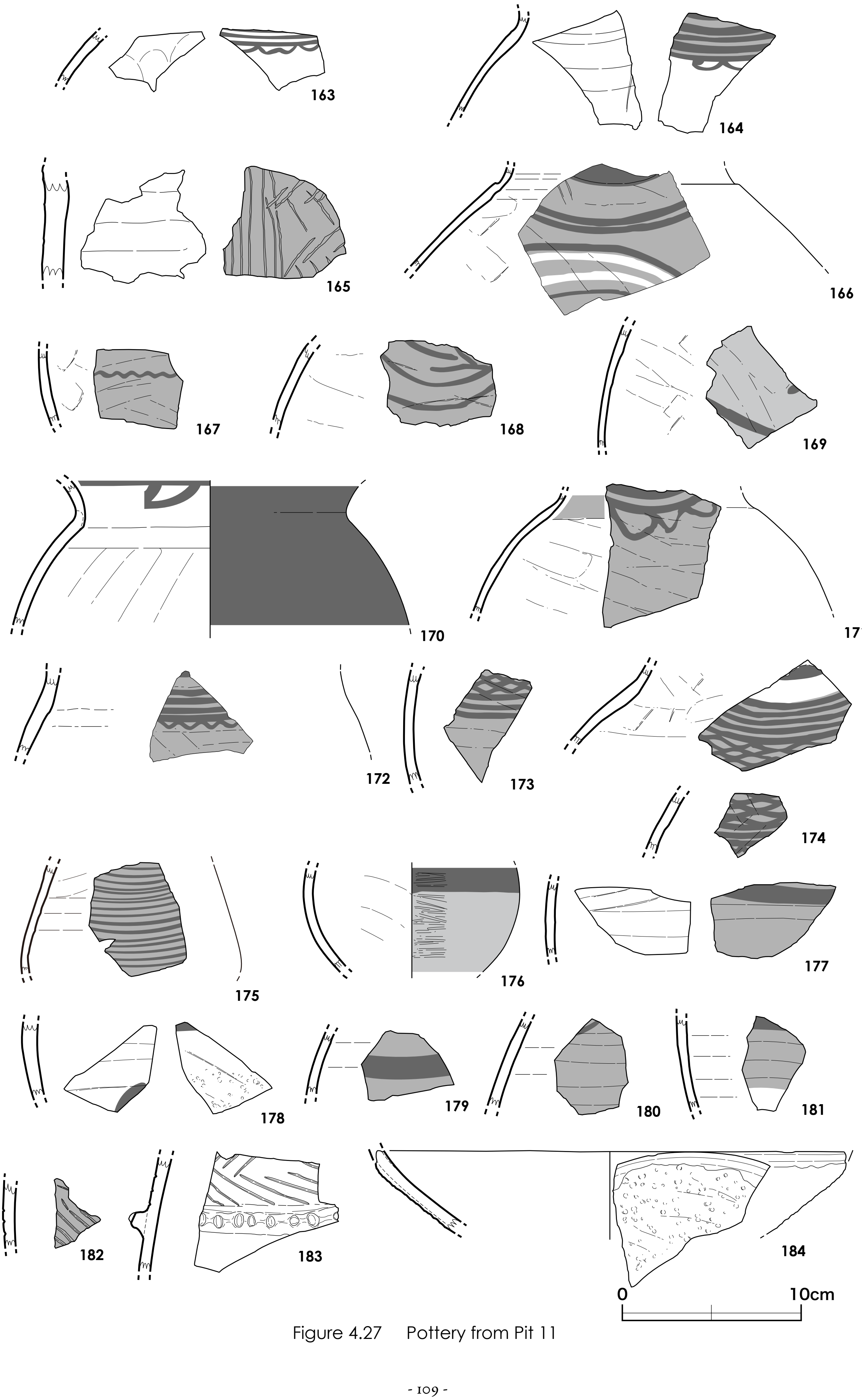


Figure 4.27 Pottery from Pit 11

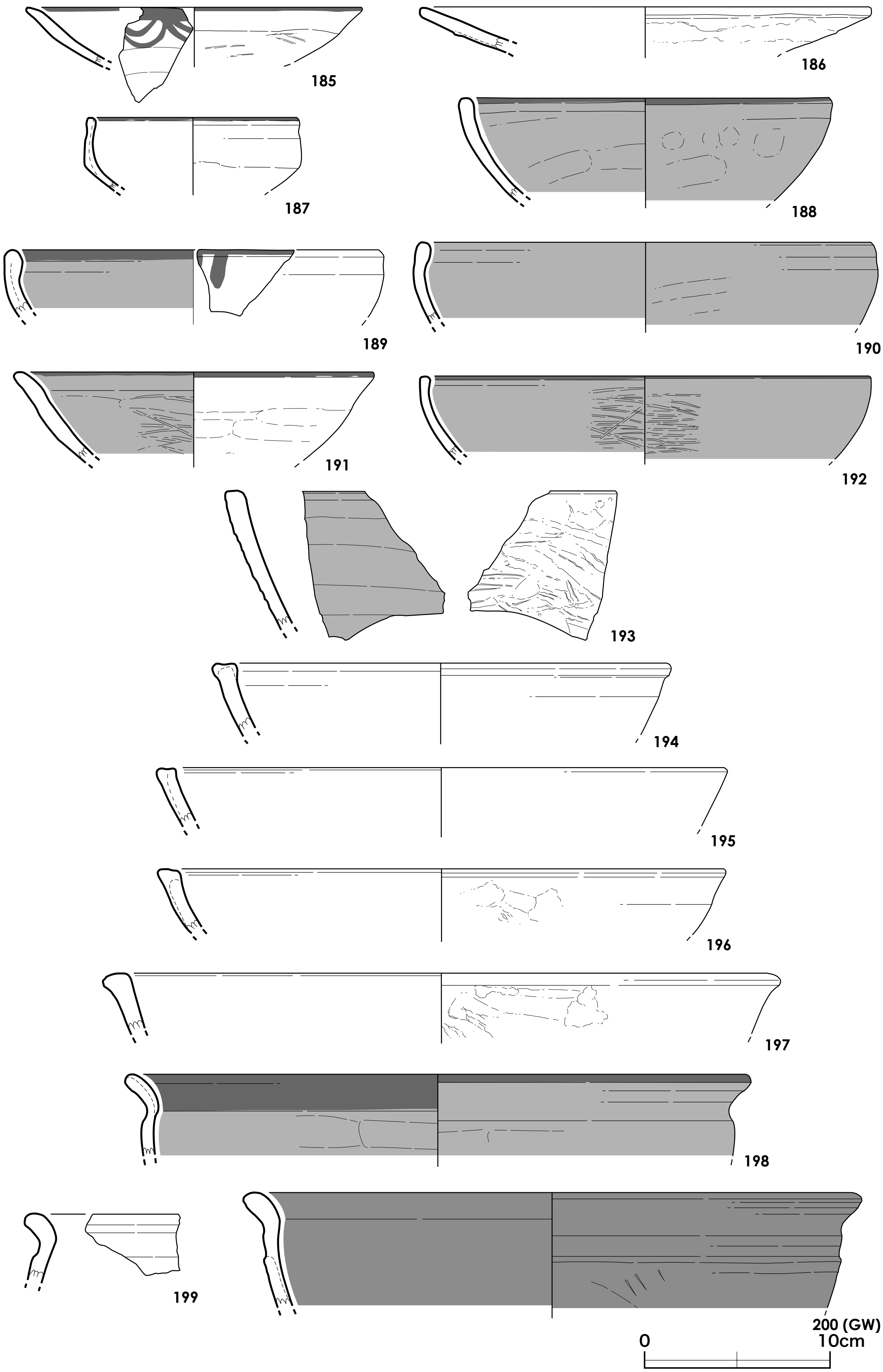


Figure 4.28 Pottery from Pit 11

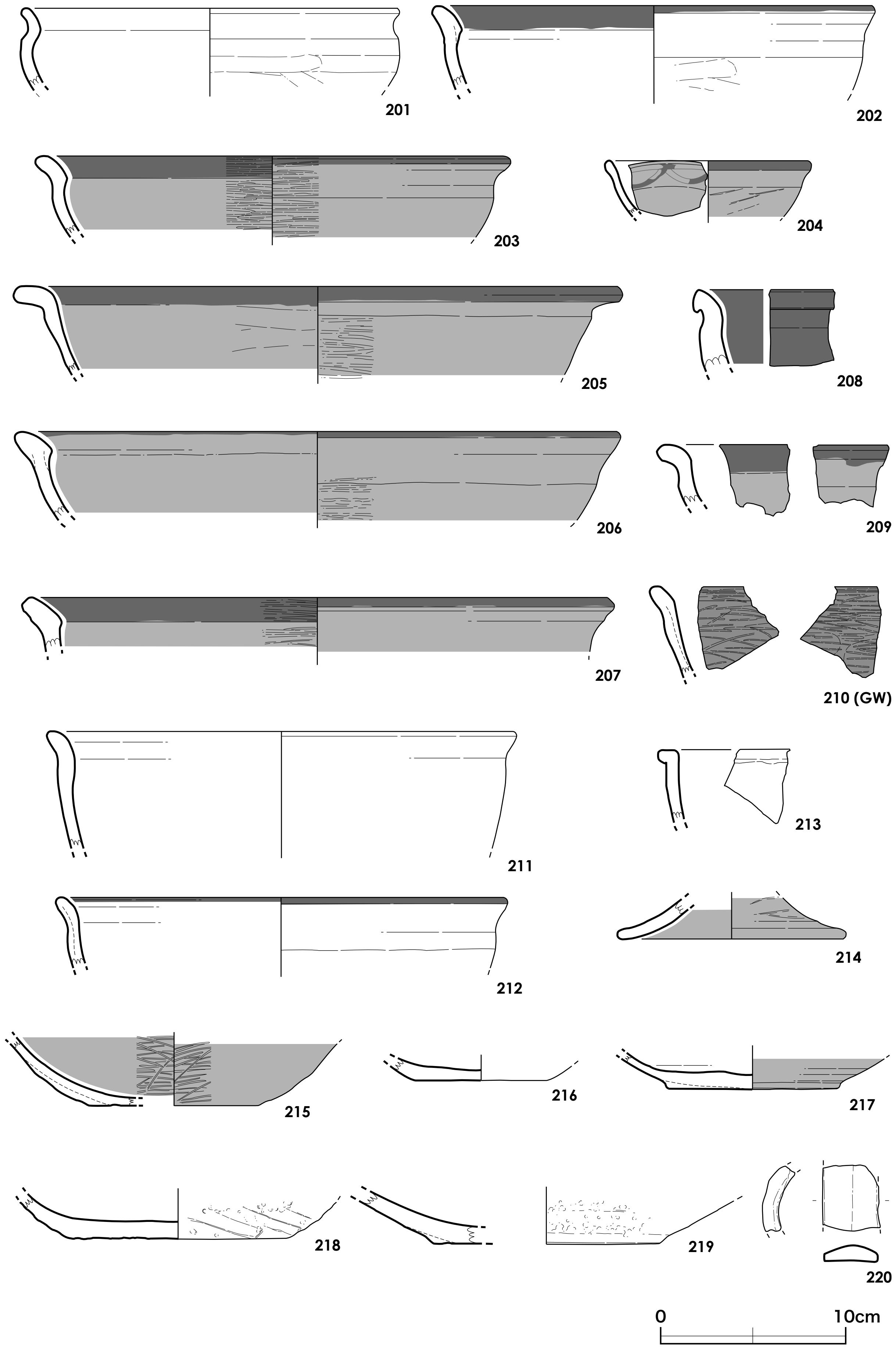


Figure 4.29 Pottery from Pit 11

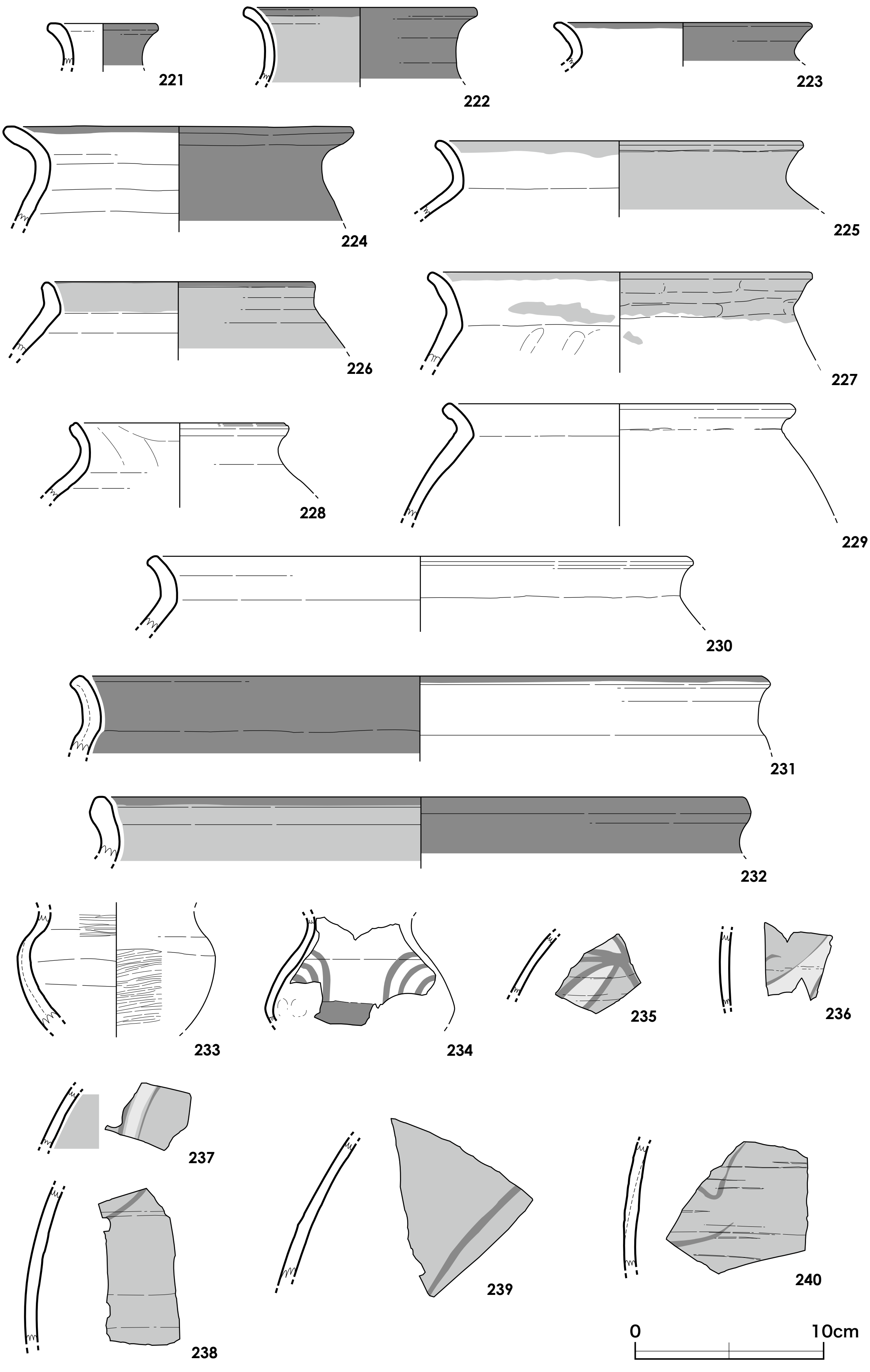


Figure 4.30 Pottery from Pit 13

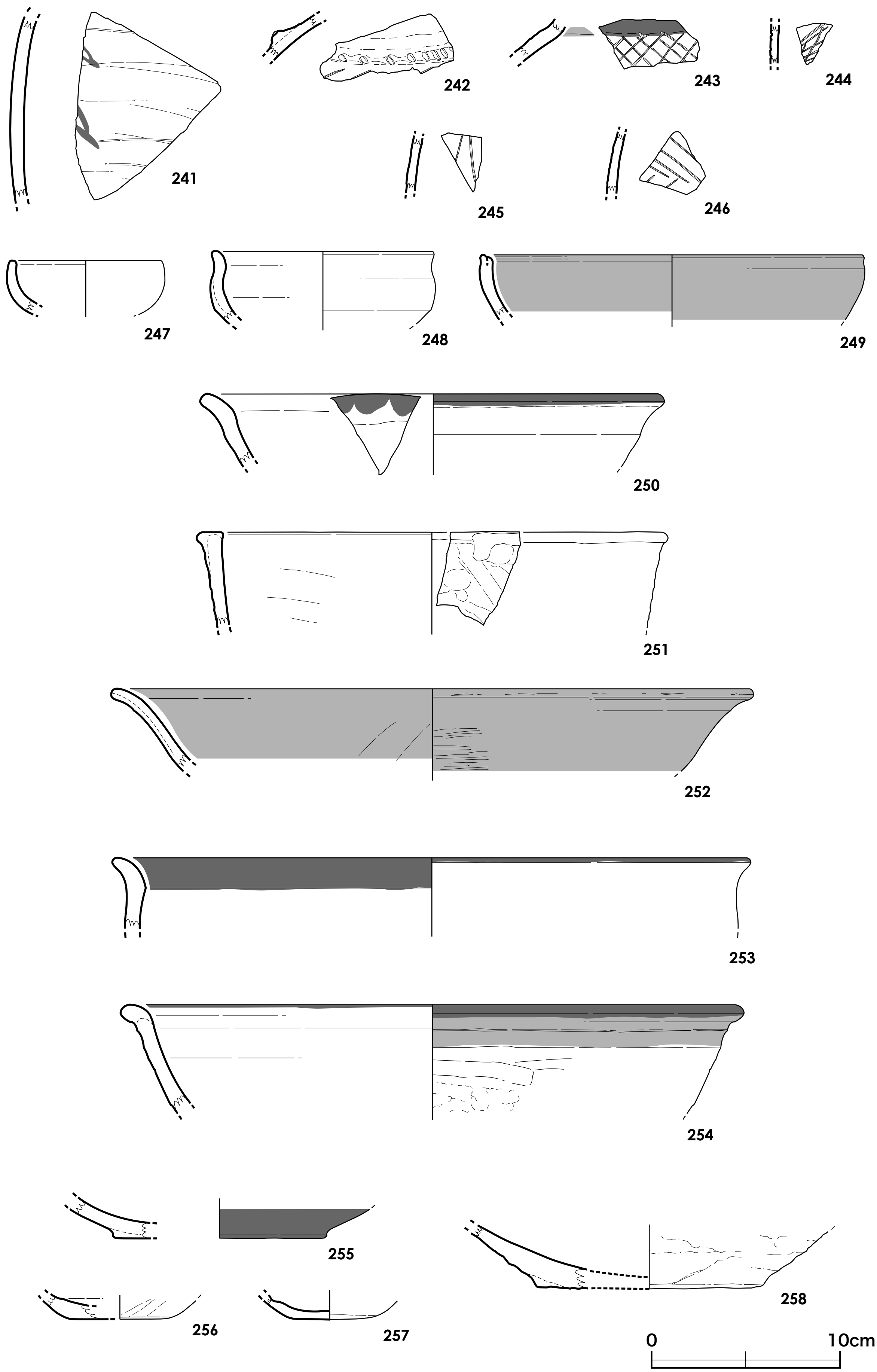


Figure 4.31 Pottery from Pit 13

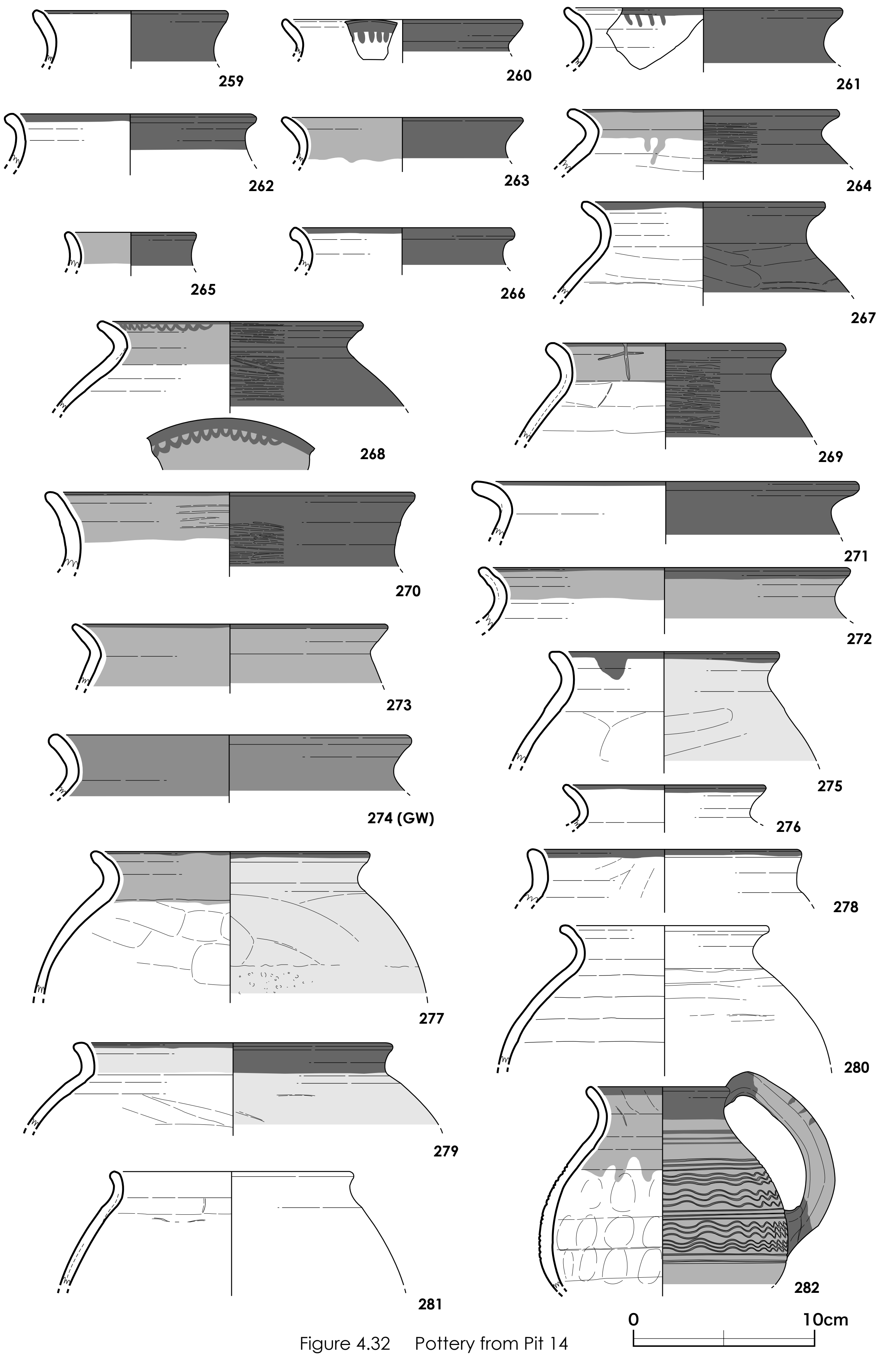


Figure 4.32   Pottery from Pit 14

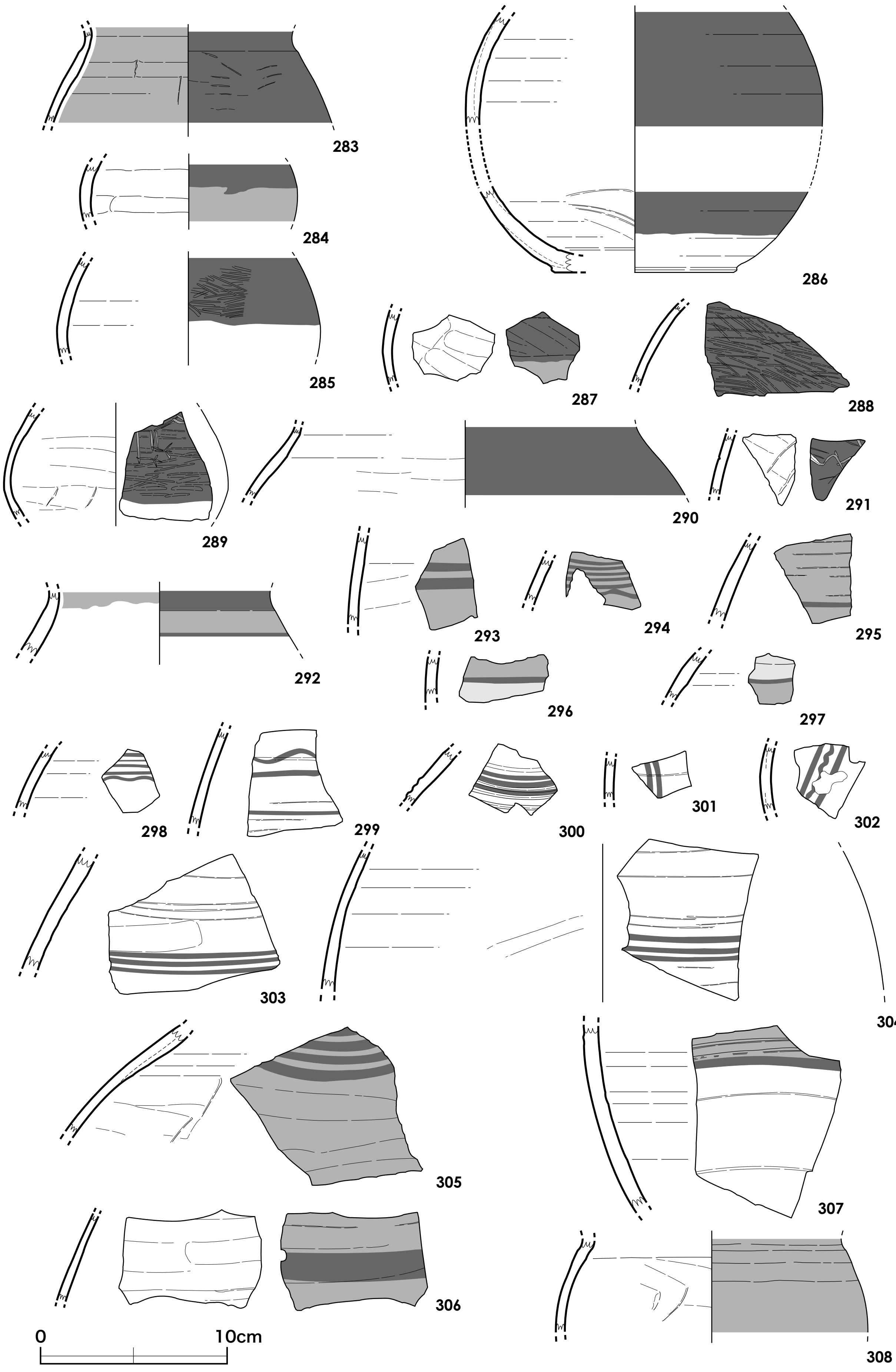


Figure 4.33 Pottery from Pit 14

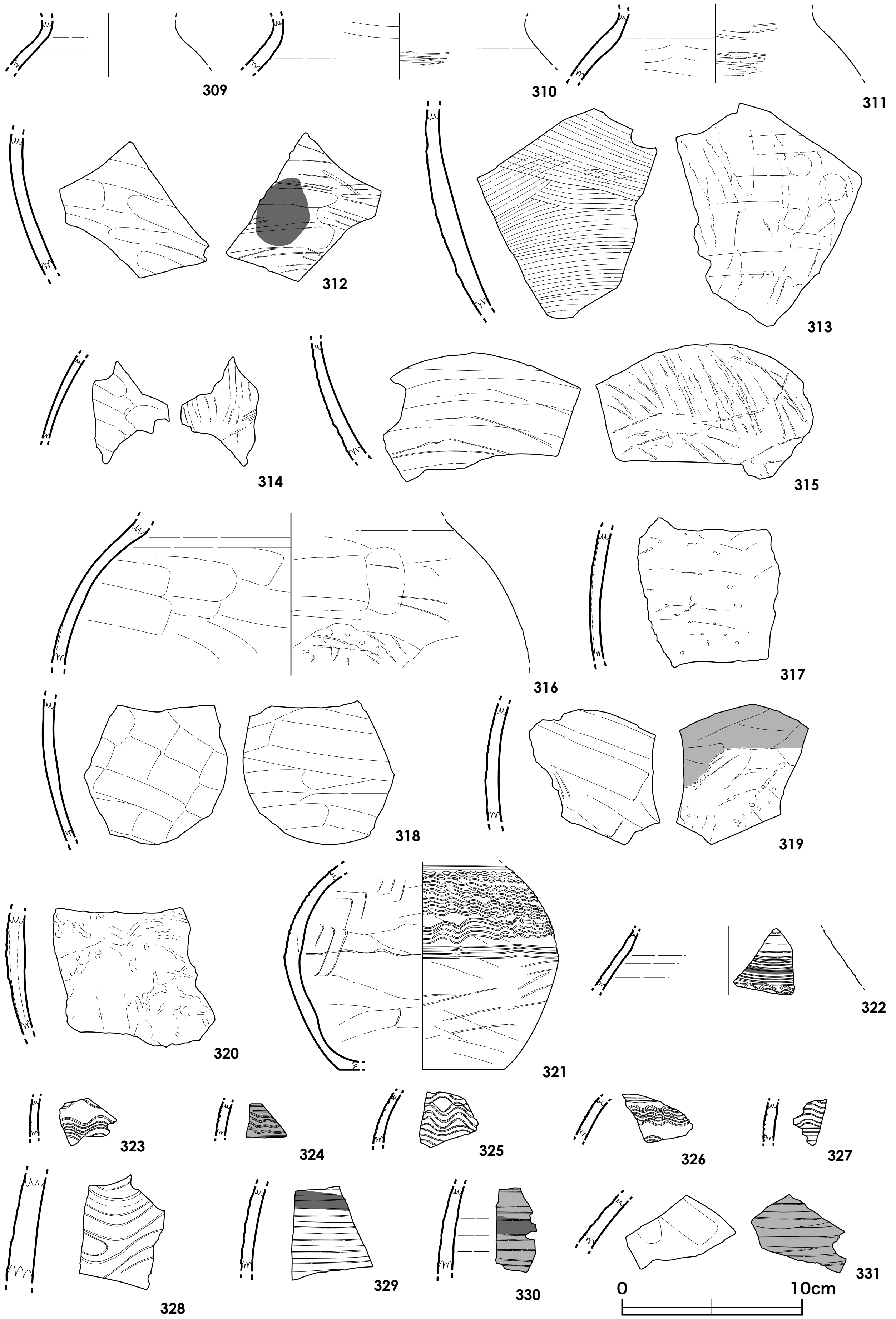


Figure 4.34 Pottery from Pit 14

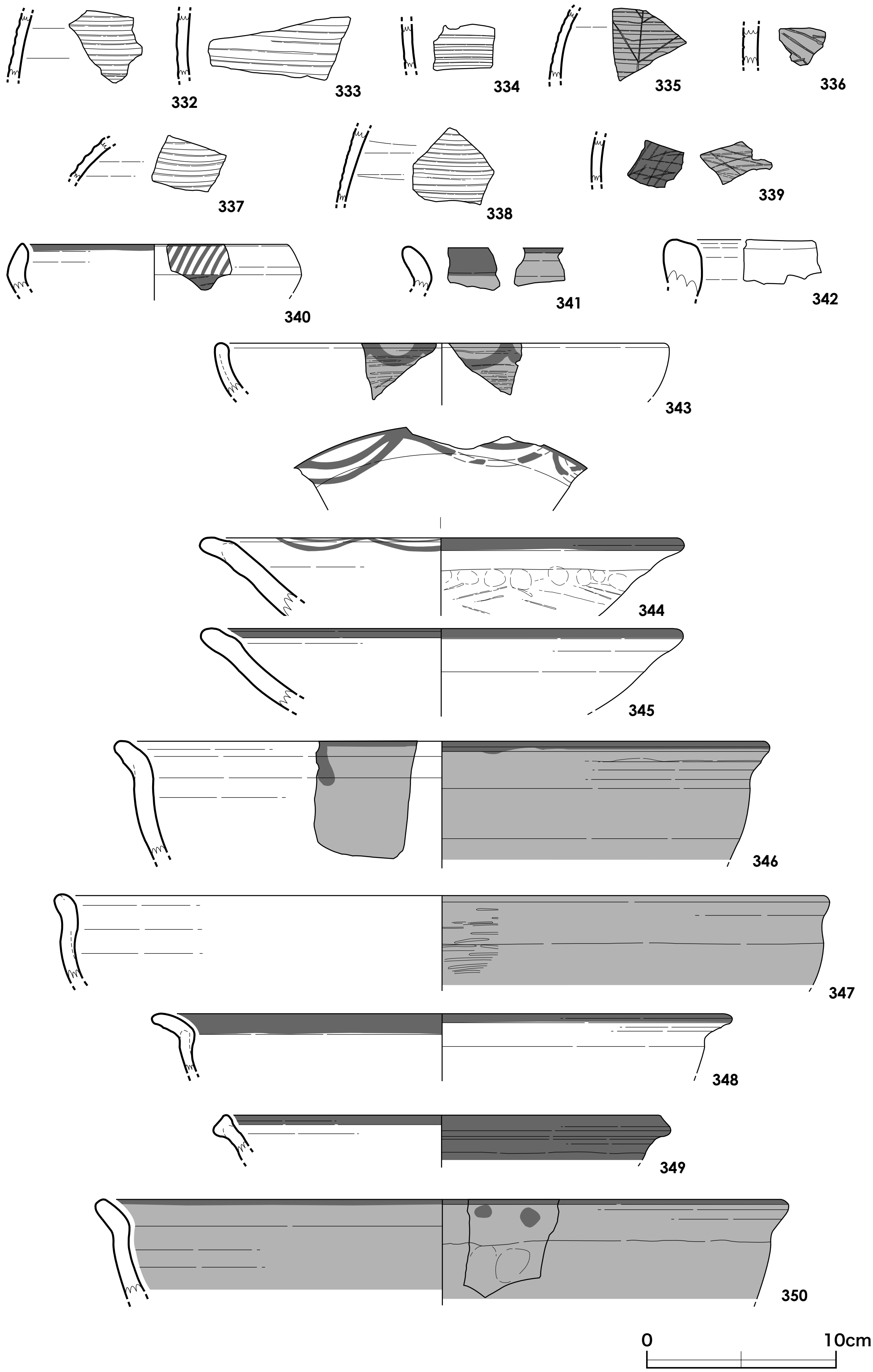


Figure 4.35 Pottery from Pit 14

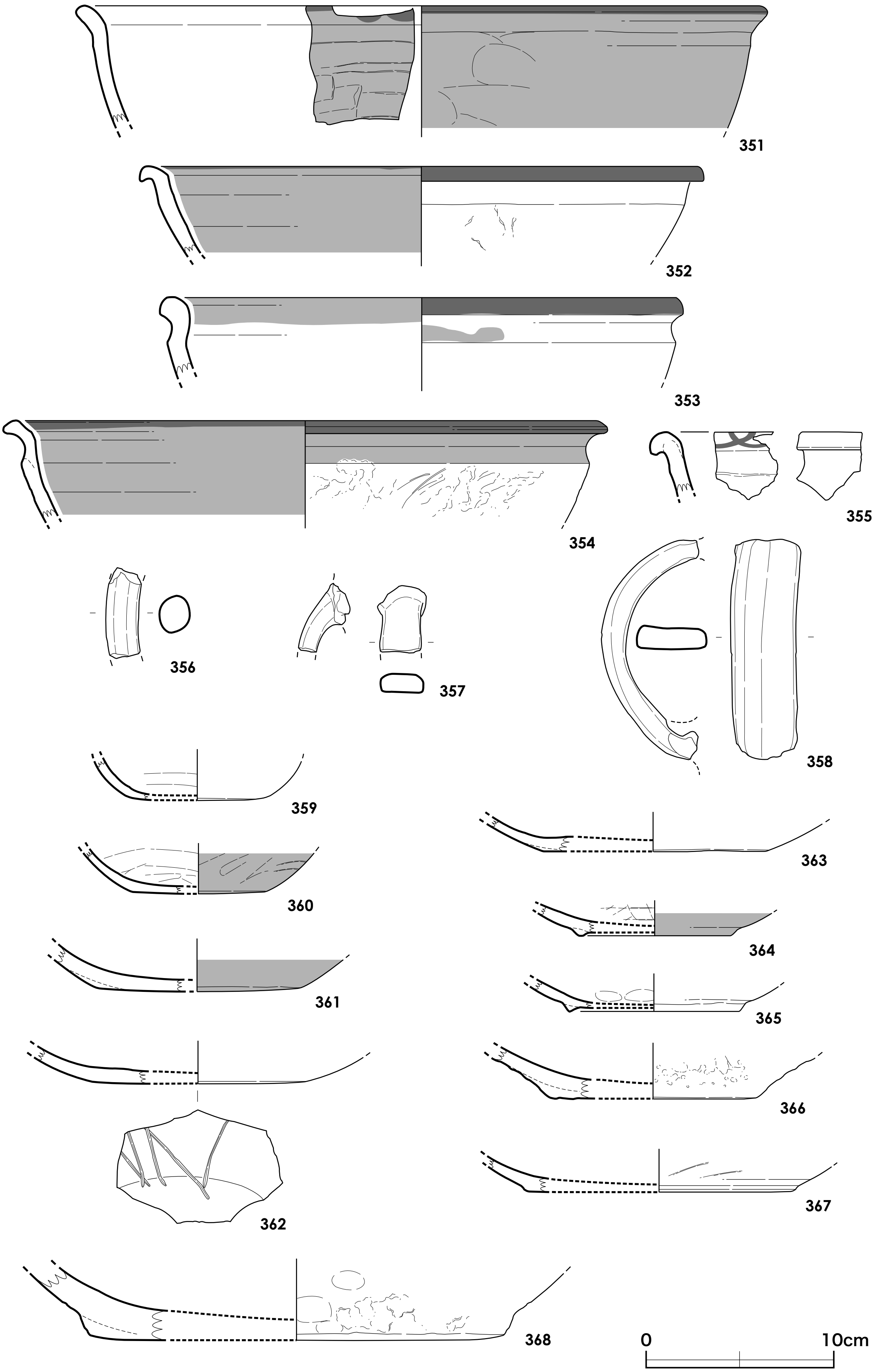


Figure 4.36 Pottery from Pit 14

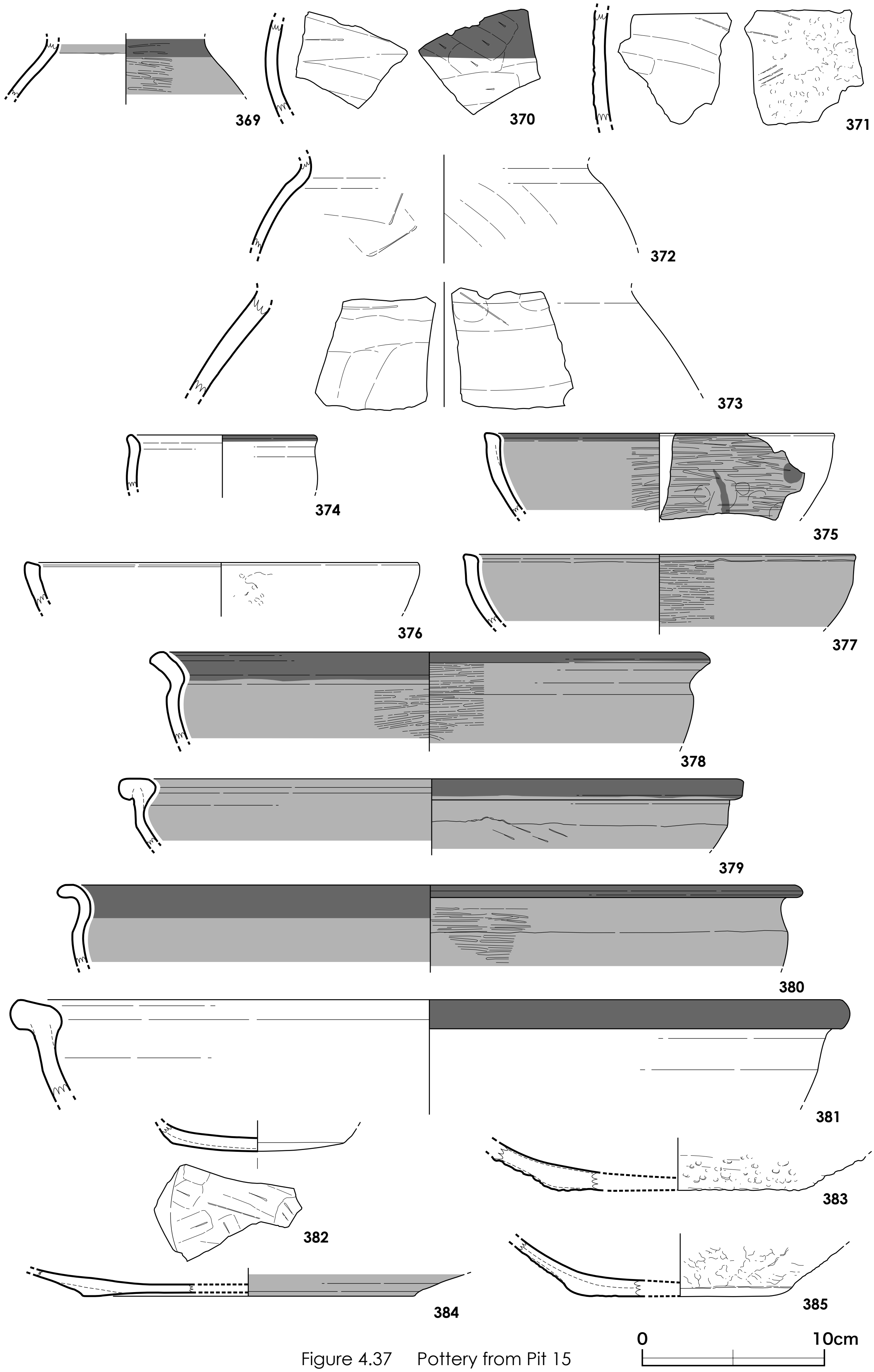


Figure 4.37 Pottery from Pit 15

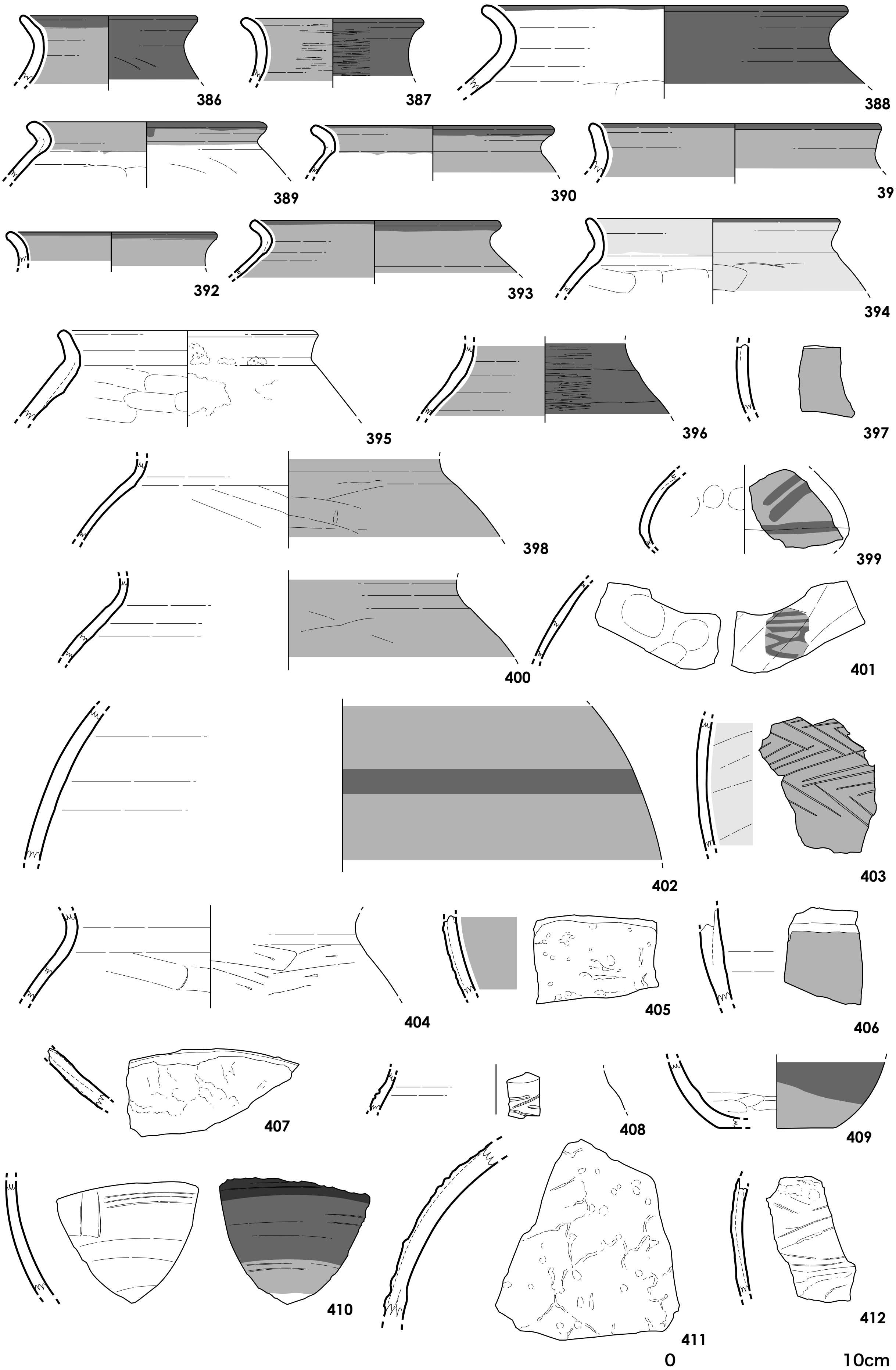


Figure 4.38 Pottery from Pit 16

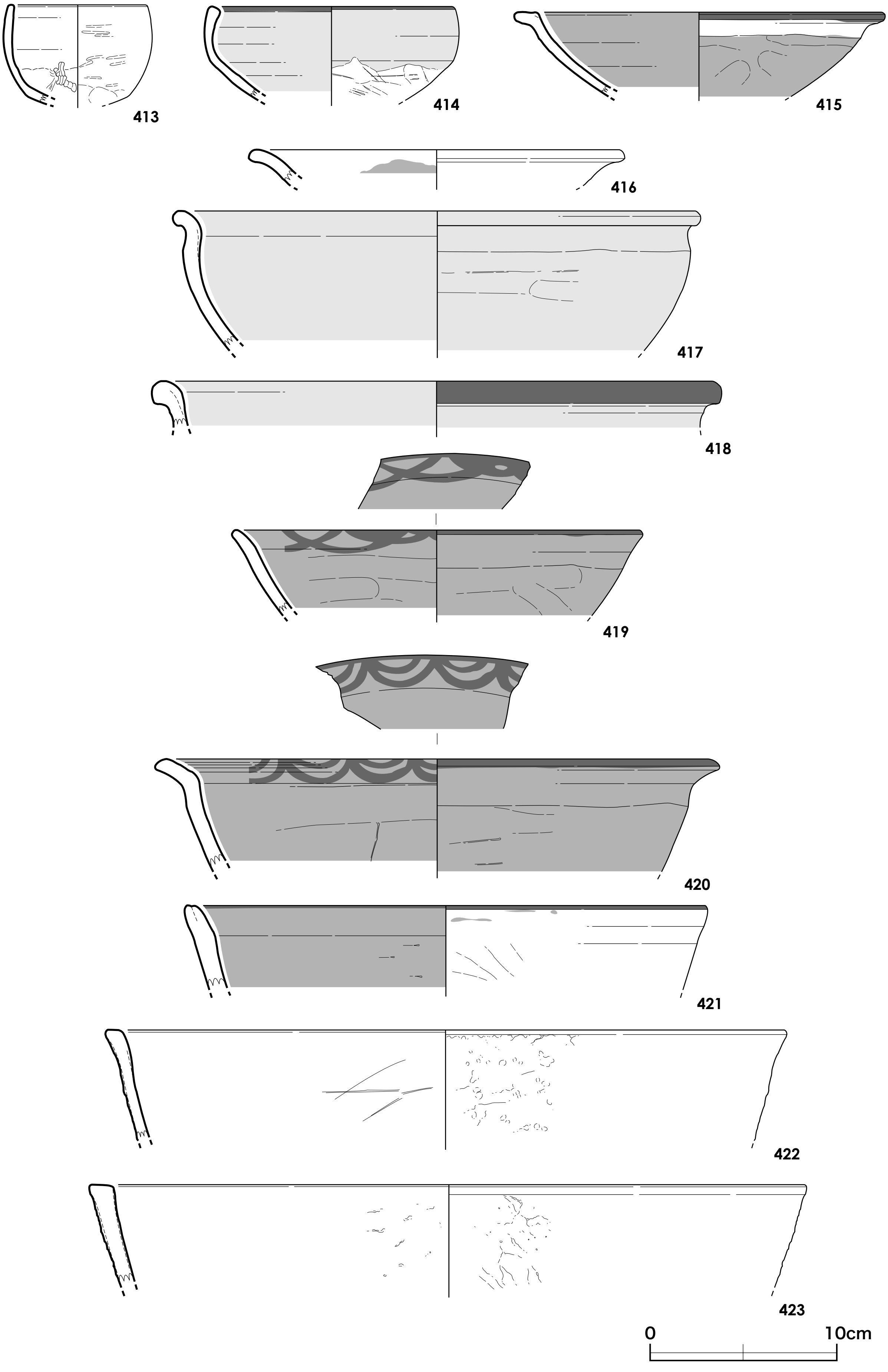


Figure 4.39 Pottery from Pit 16

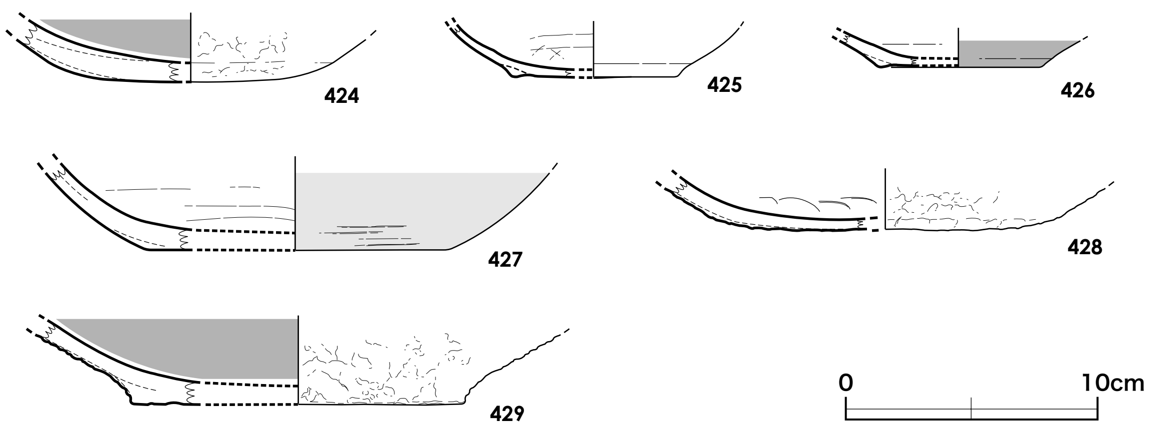


Figure 4.40 Pottery from Pit 16

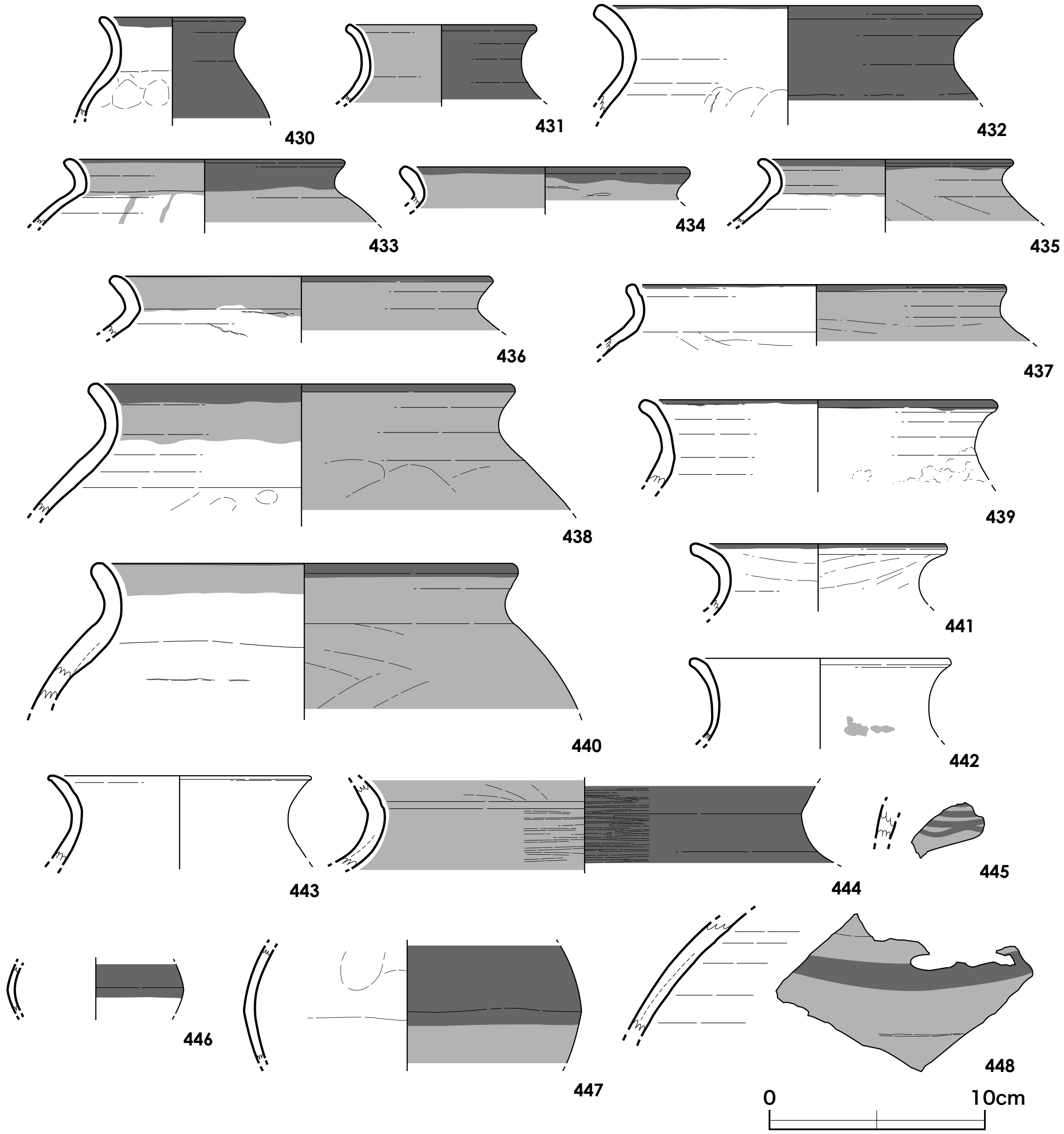


Figure 4.41 Pottery from Pit 18

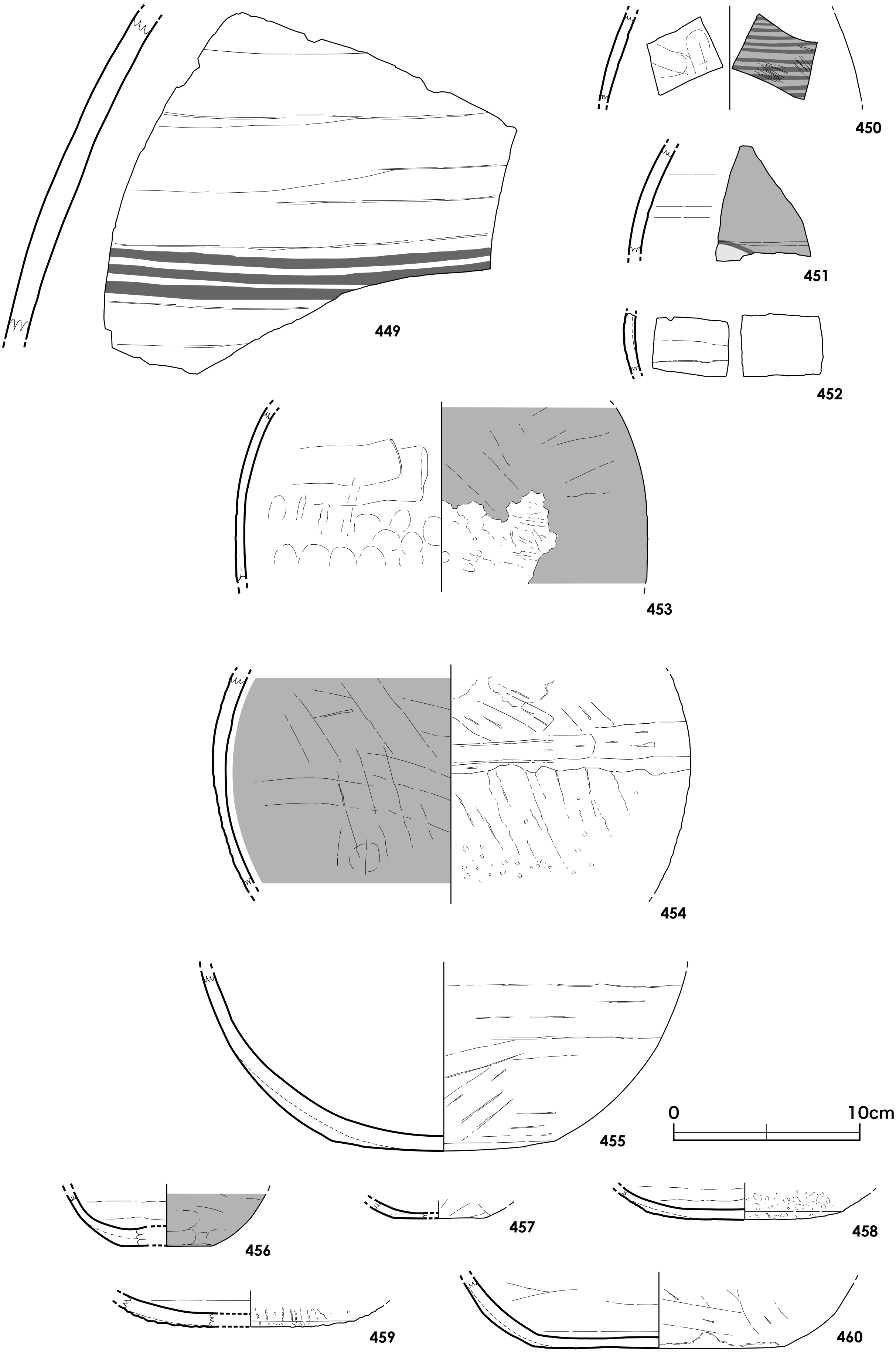


Figure 4.42 Pottery from Pit 18

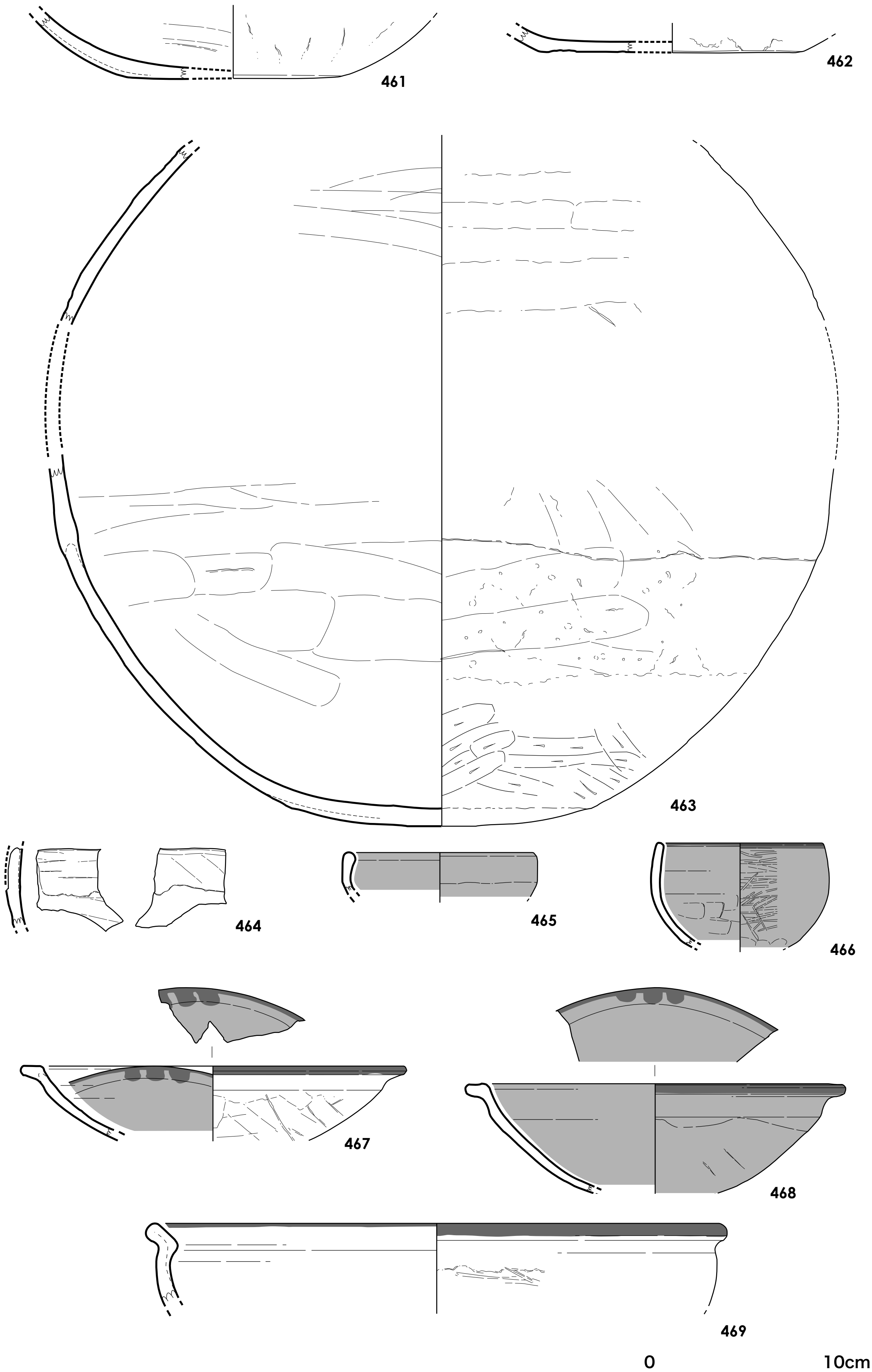


Figure 4.43   Pottery from Pit 18

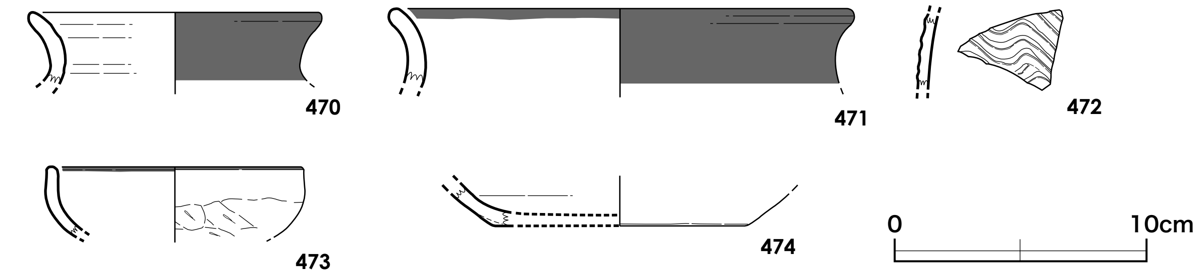


Figure 4.44 Pottery from Pit 19

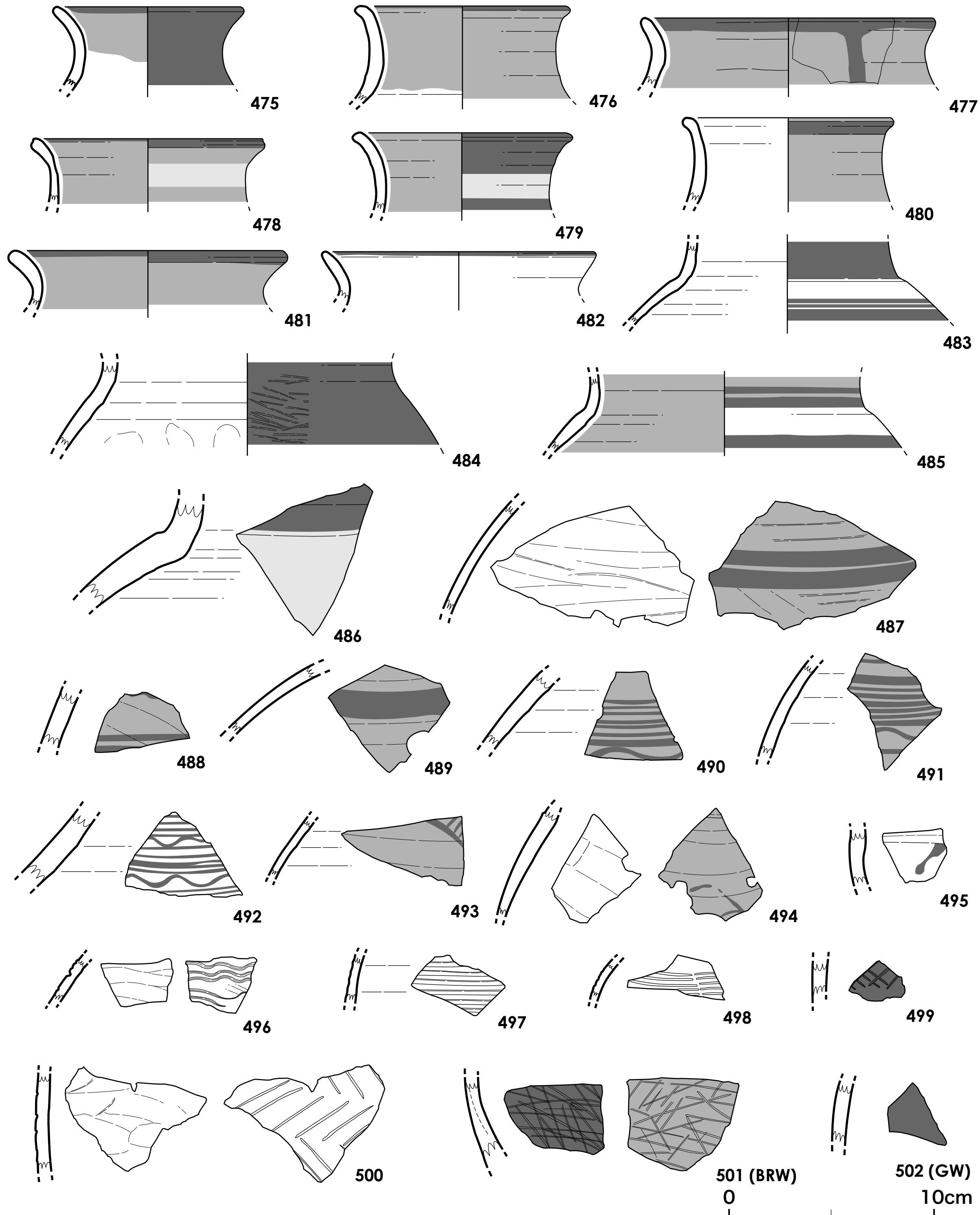


Figure 4.45 Pottery from Pit 20

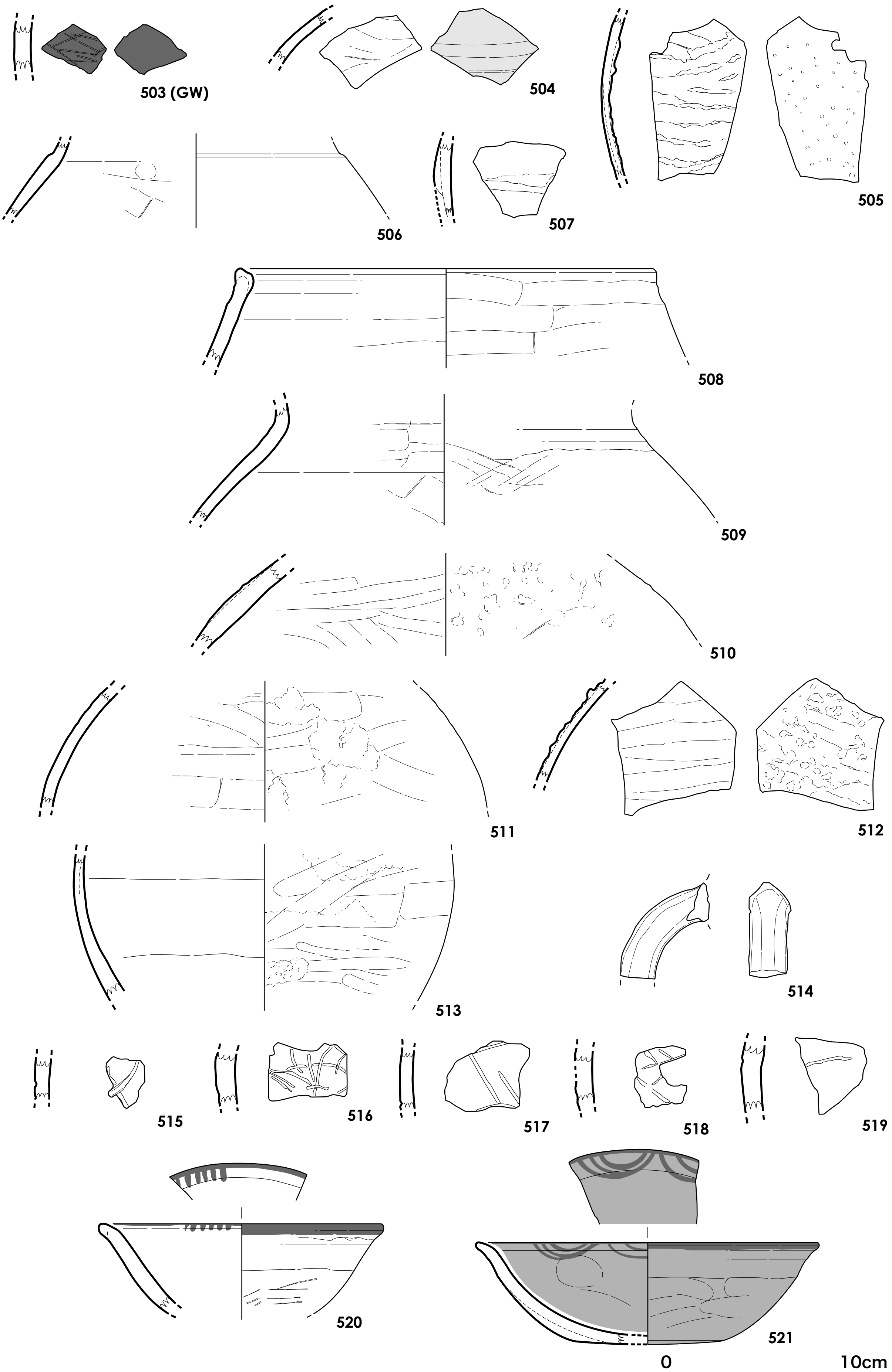


Figure 4.46   Pottery from Pit 20

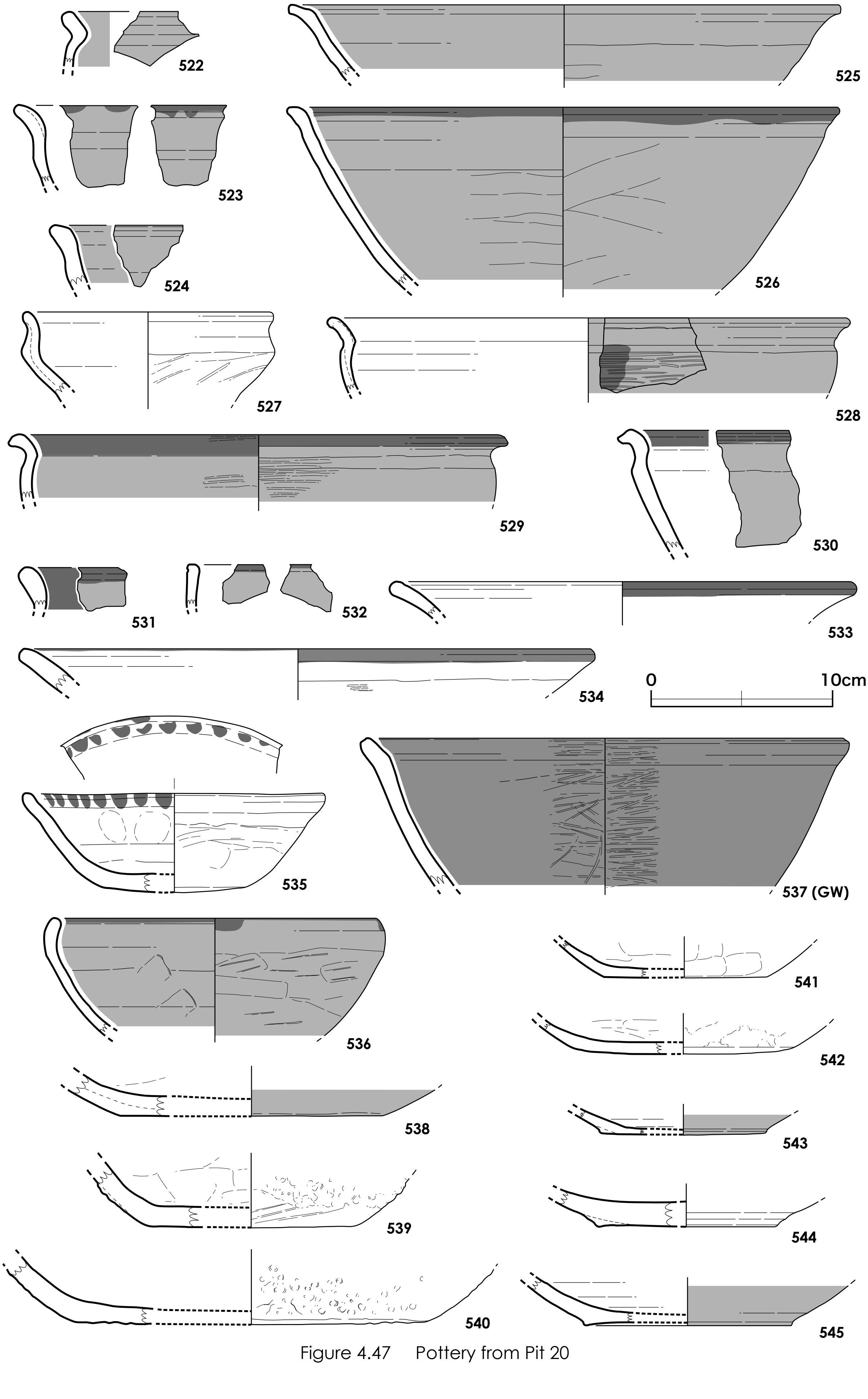


Figure 4.47 Pottery from Pit 20

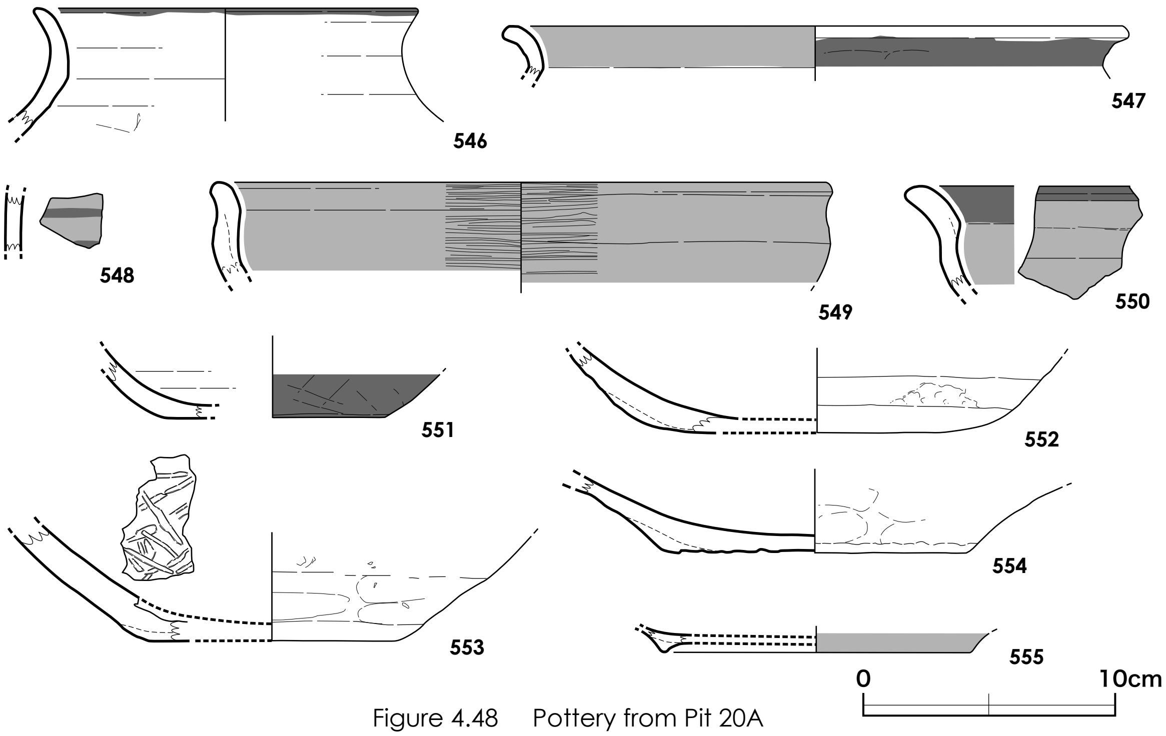


Figure 4.48 Pottery from Pit 20A

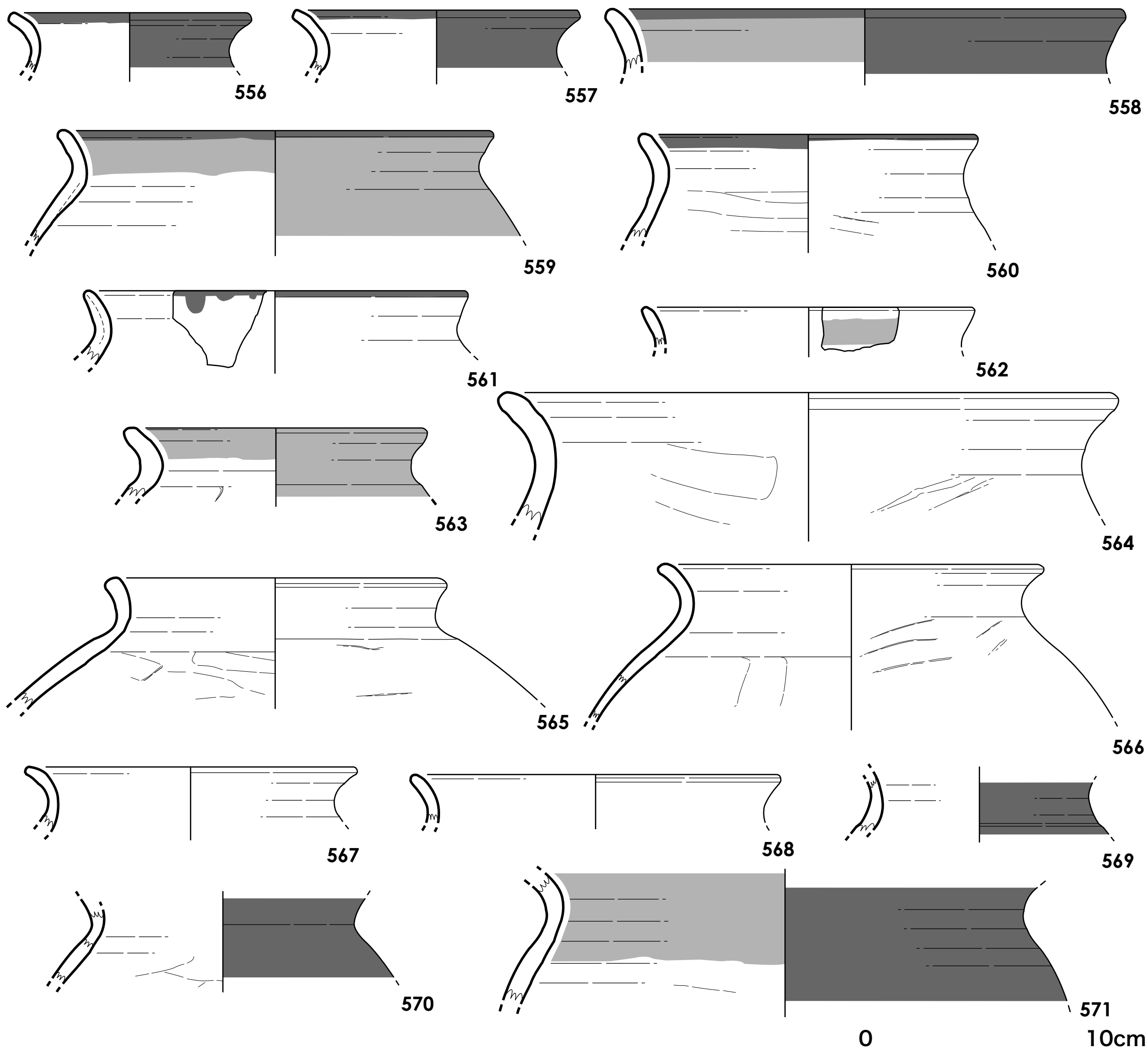


Figure 4.49 Pottery from Pit 21

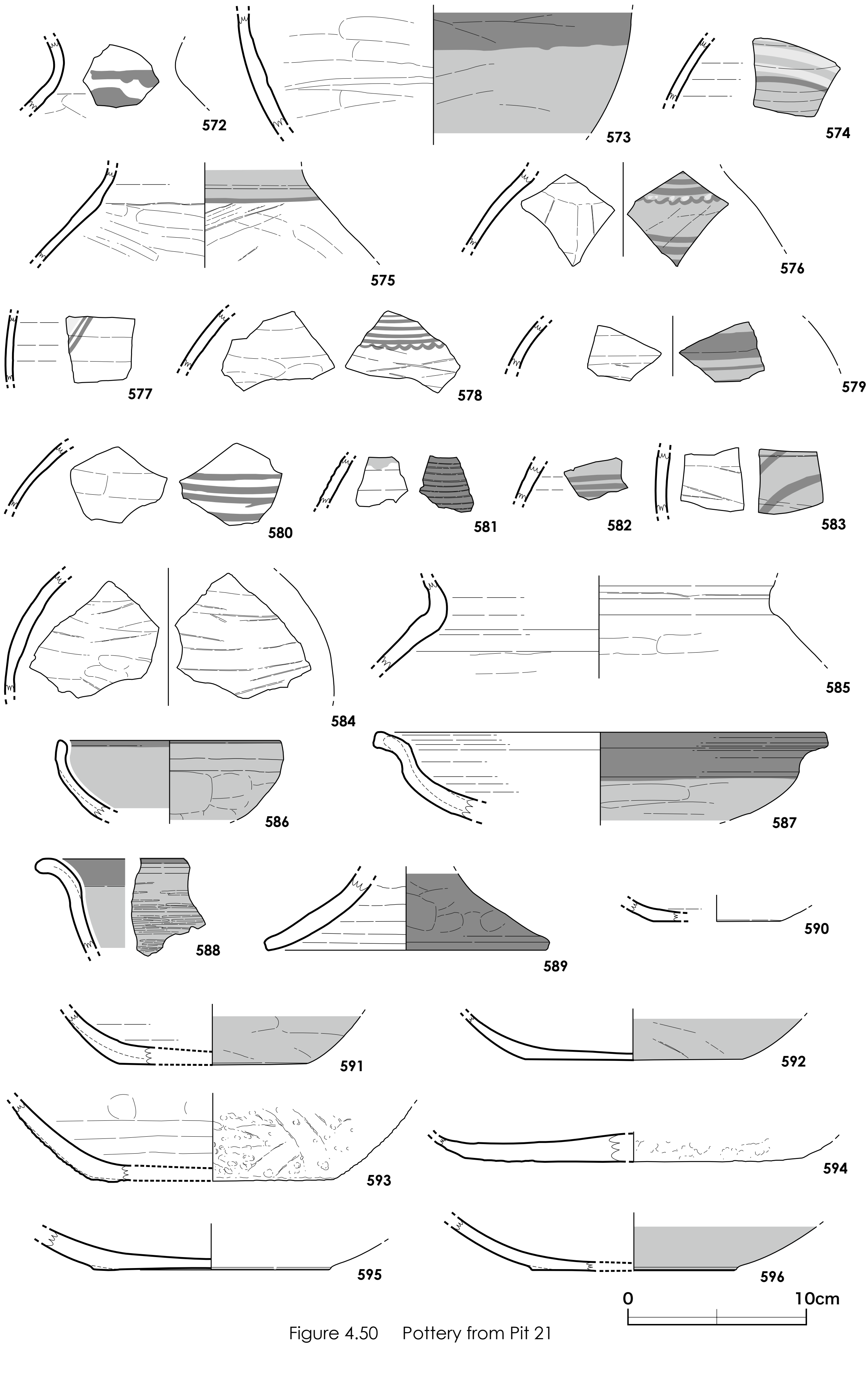


Figure 4.50 Pottery from Pit 21

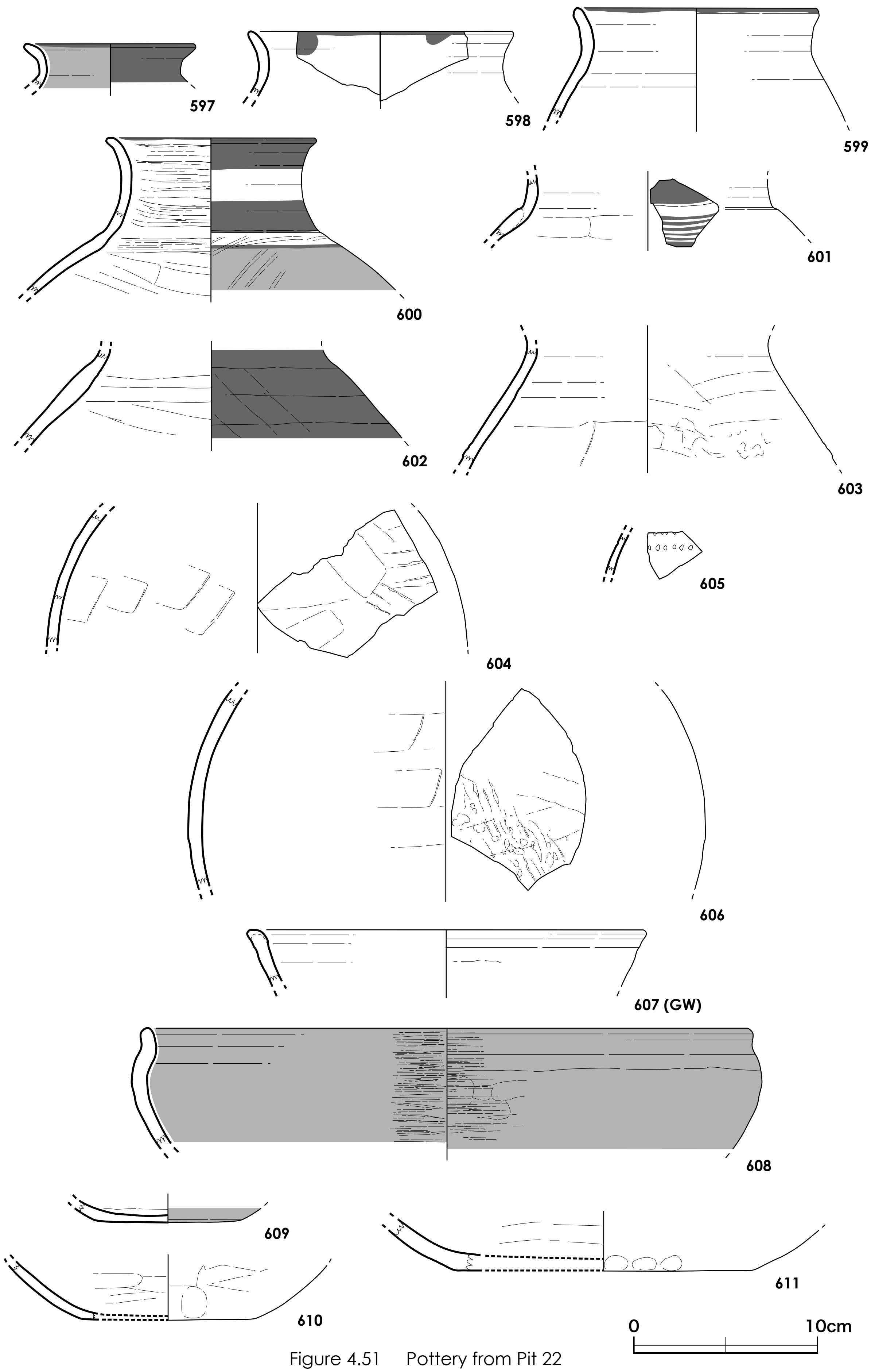


Figure 4.51 Pottery from Pit 22

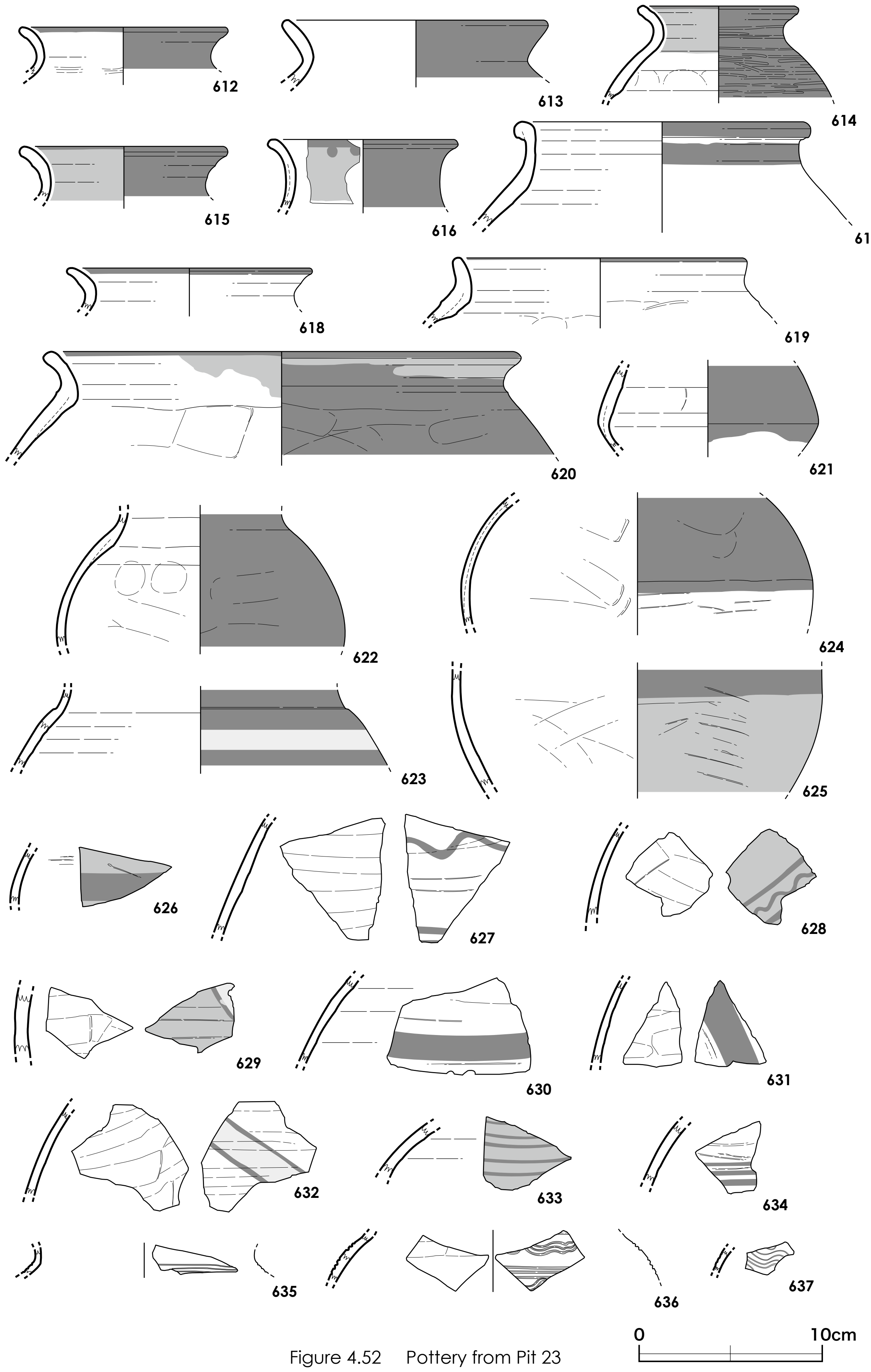


Figure 4.52 Pottery from Pit 23

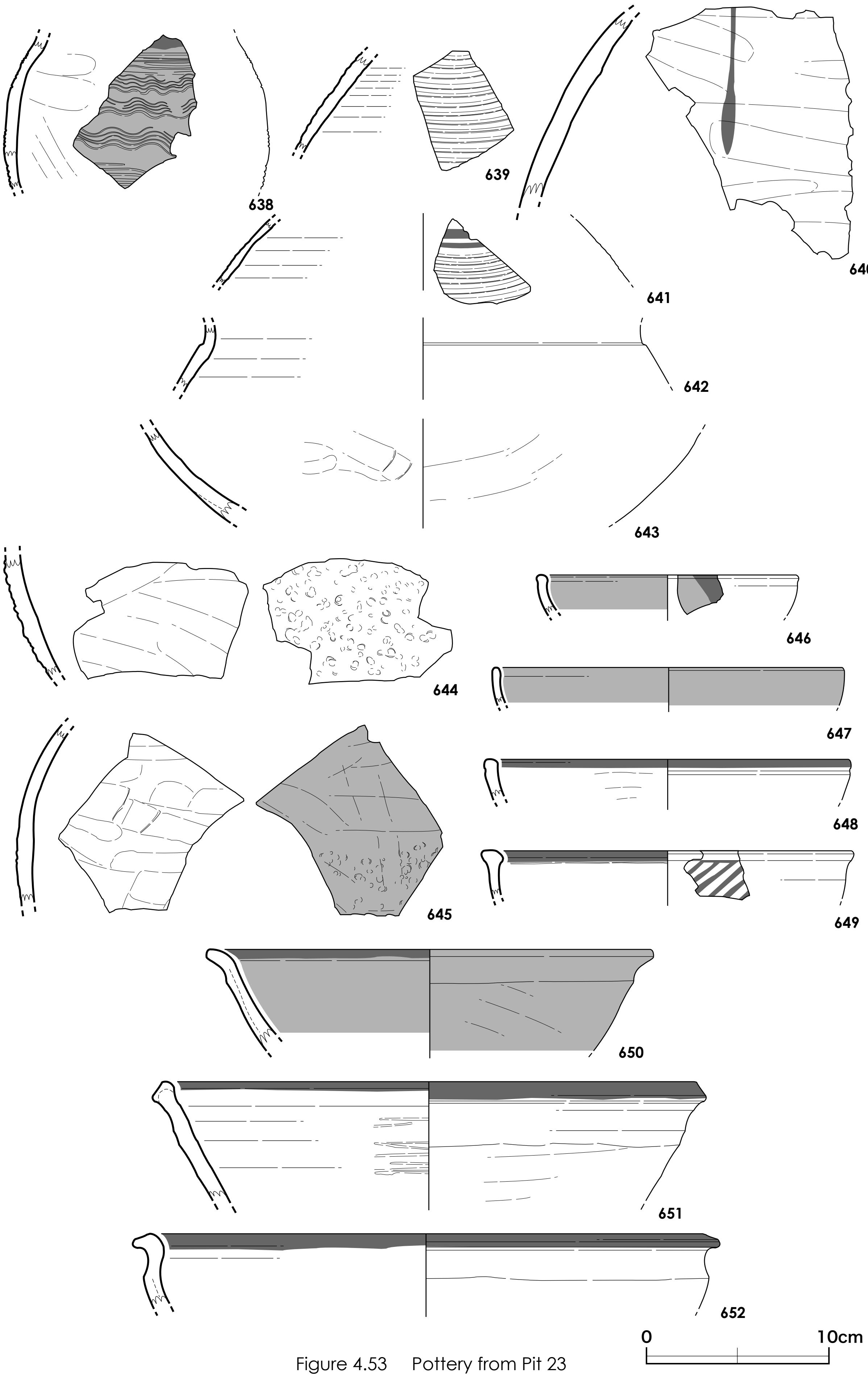


Figure 4.53   Pottery from Pit 23

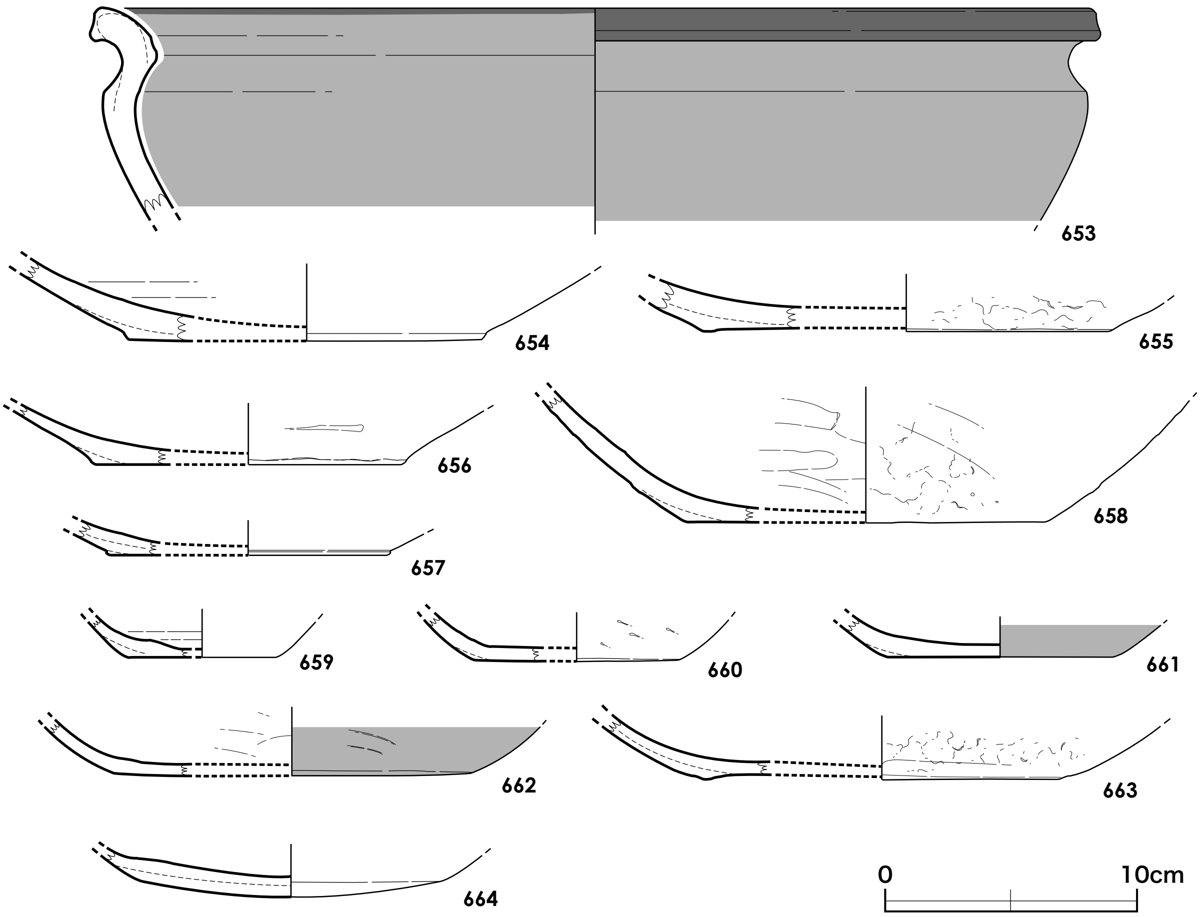


Figure 4.54 Pottery from Pit 23

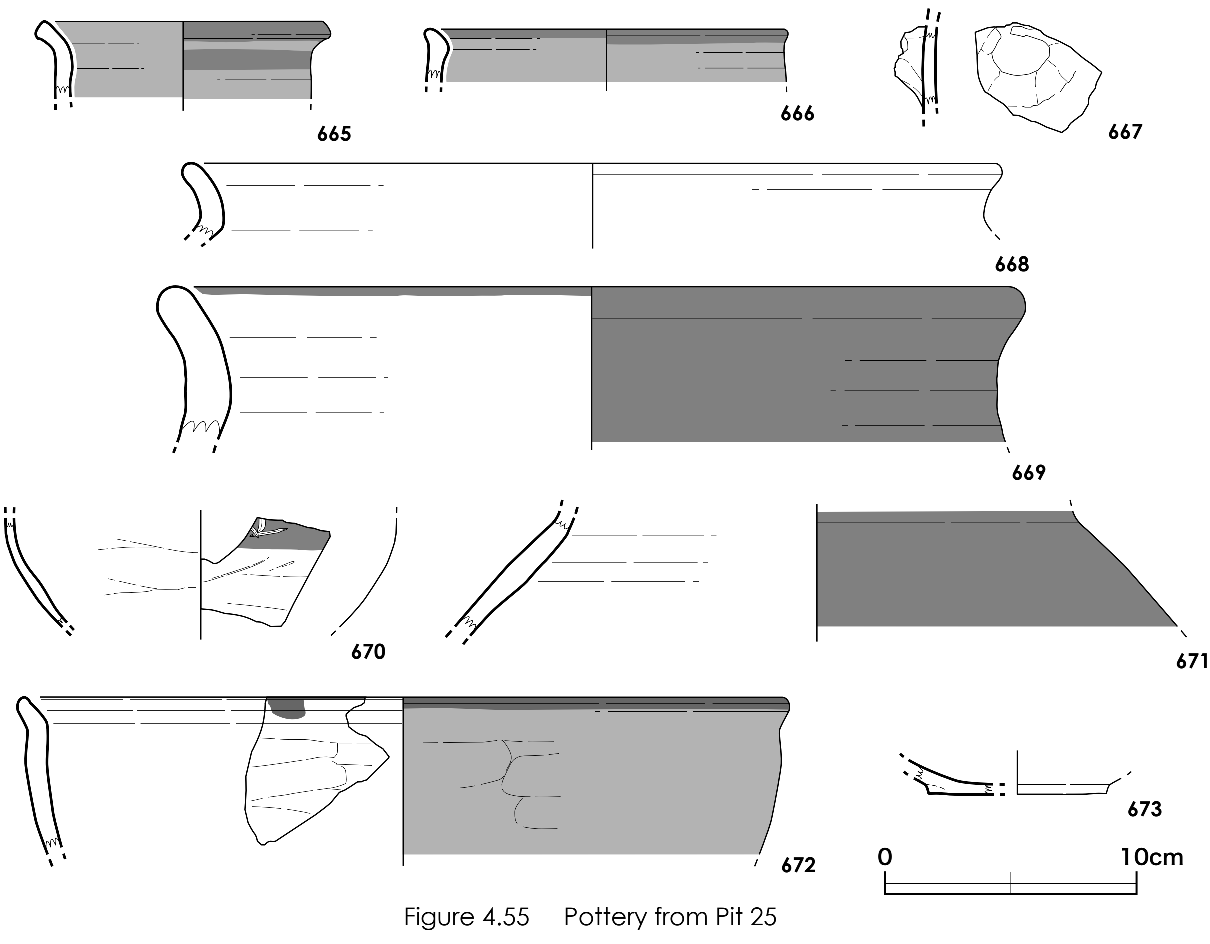


Figure 4.55 Pottery from Pit 25

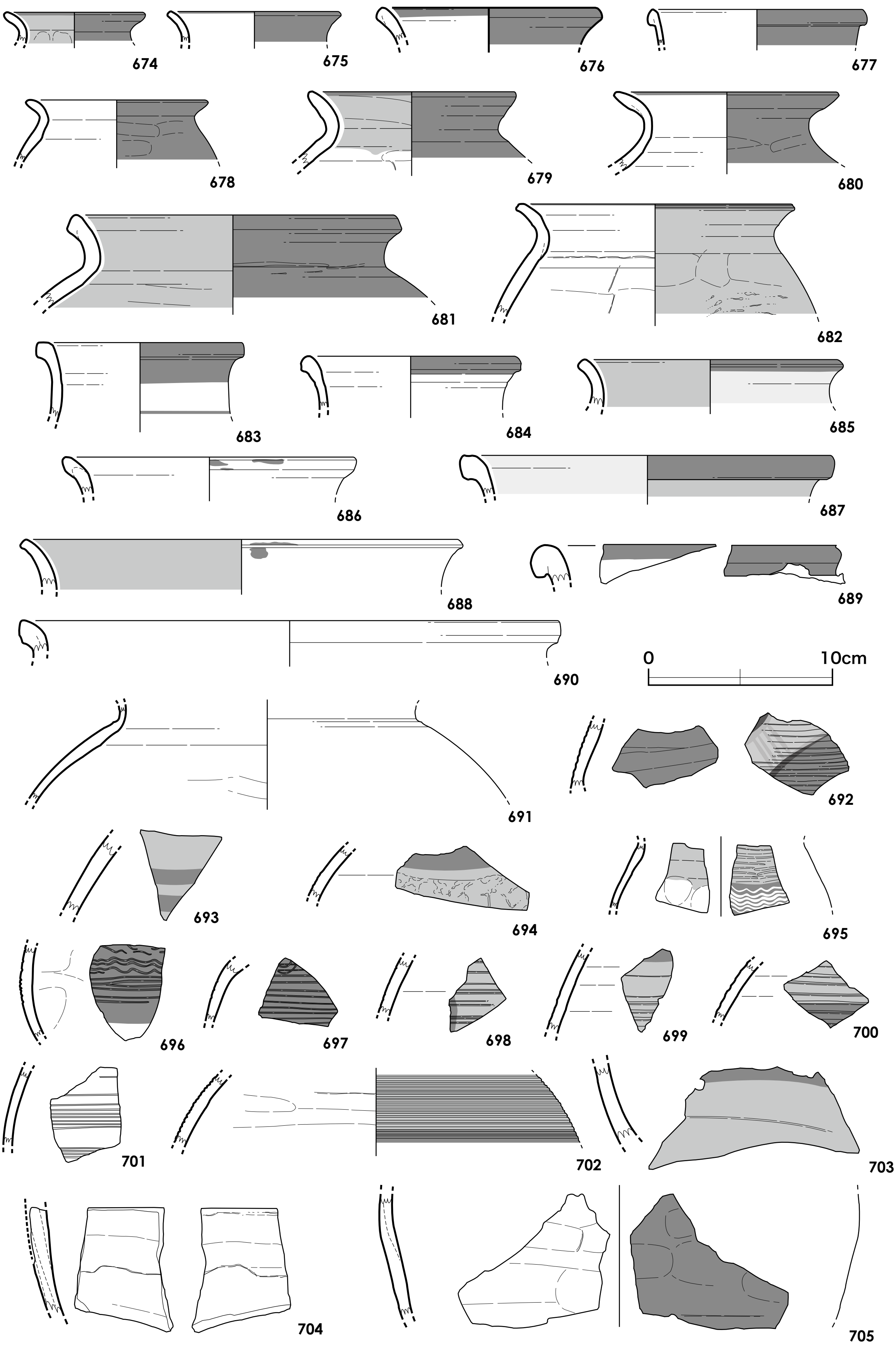


Figure 4.56 Pottery from Pit 26

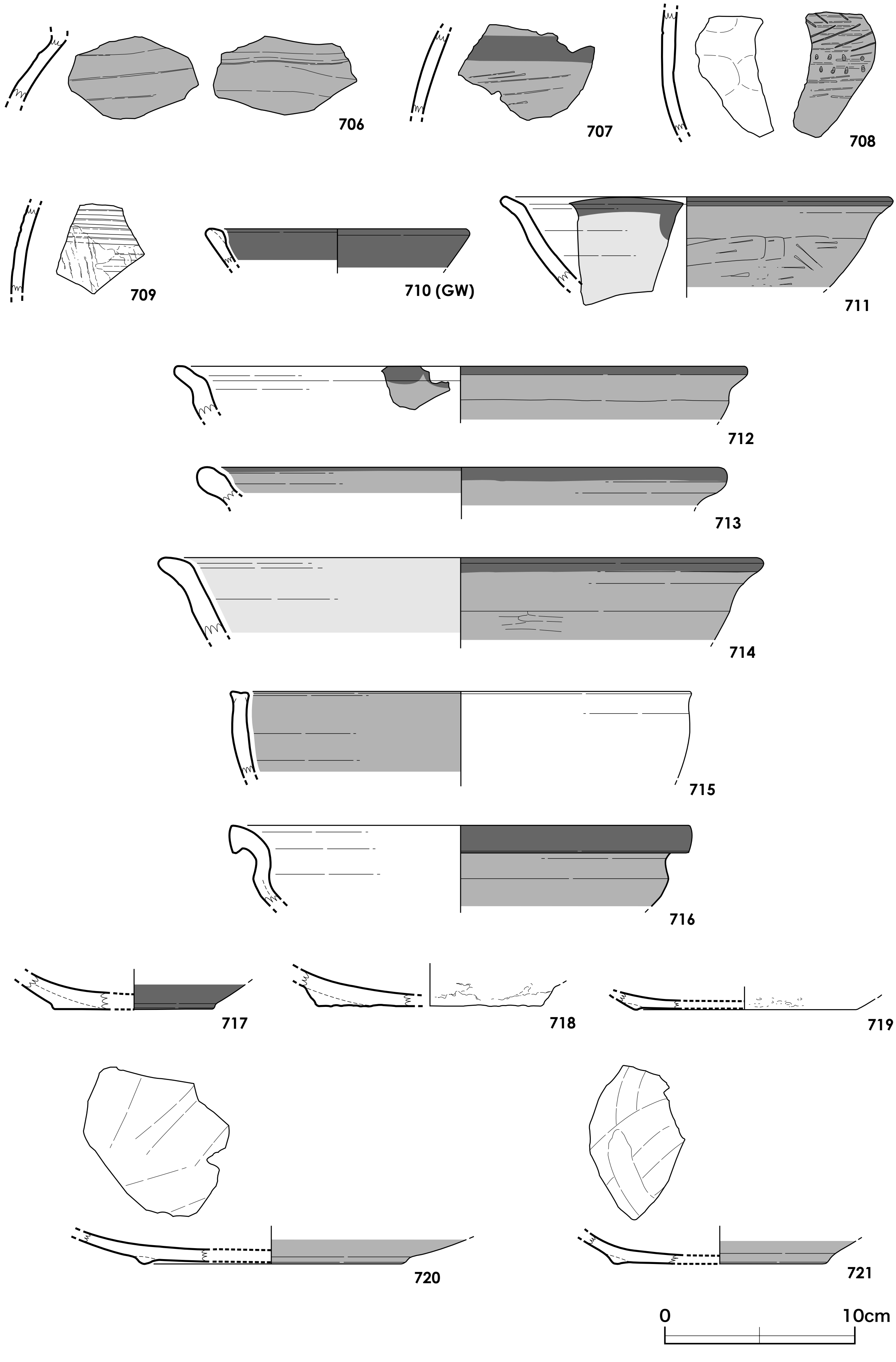


Figure 4.57 Pottery from Pit 26

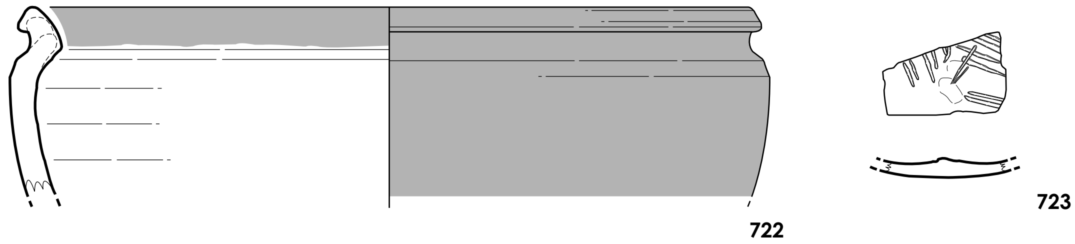


Figure 4.58 Pottery from Pit 27

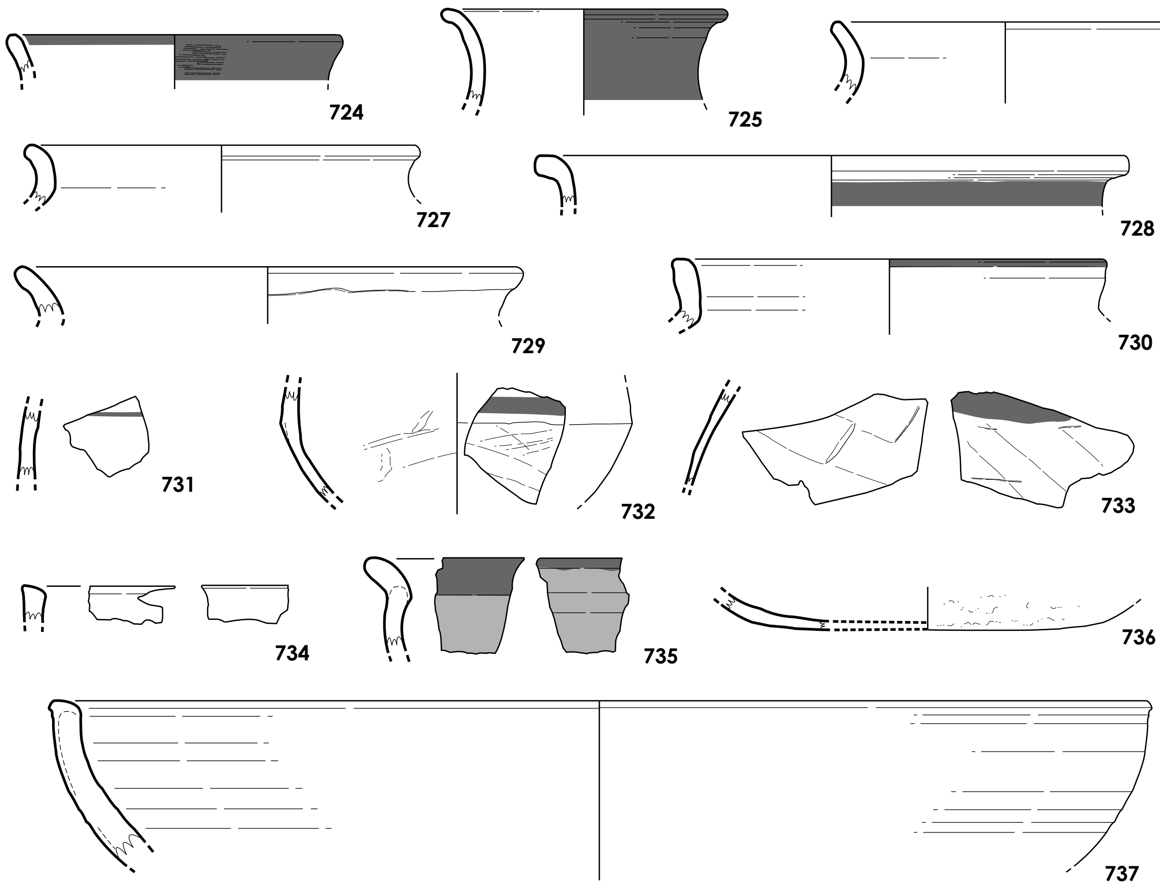


Figure 4.59 Pottery from Pit 27A

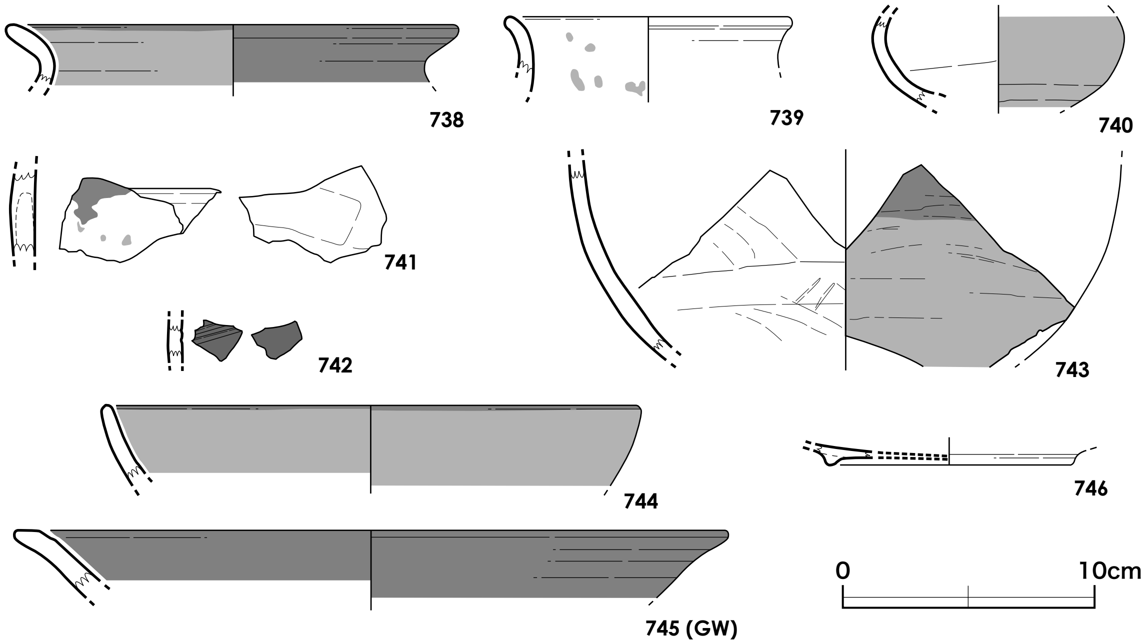


Figure 4.60 Pottery from Pit 28

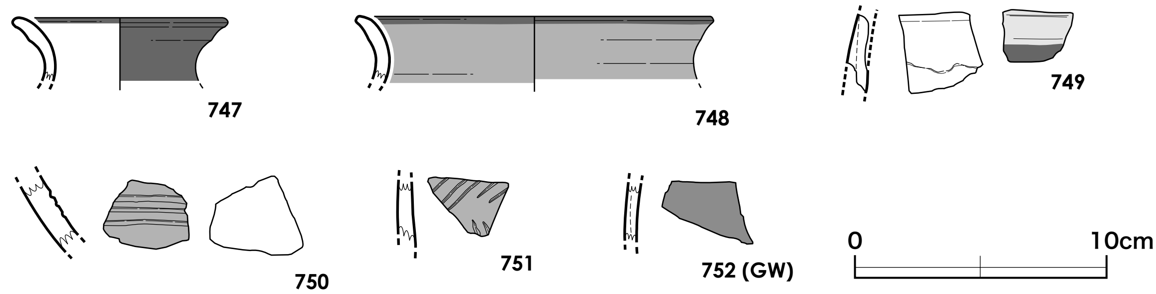


Figure 4.61 Pottery from Pit 32

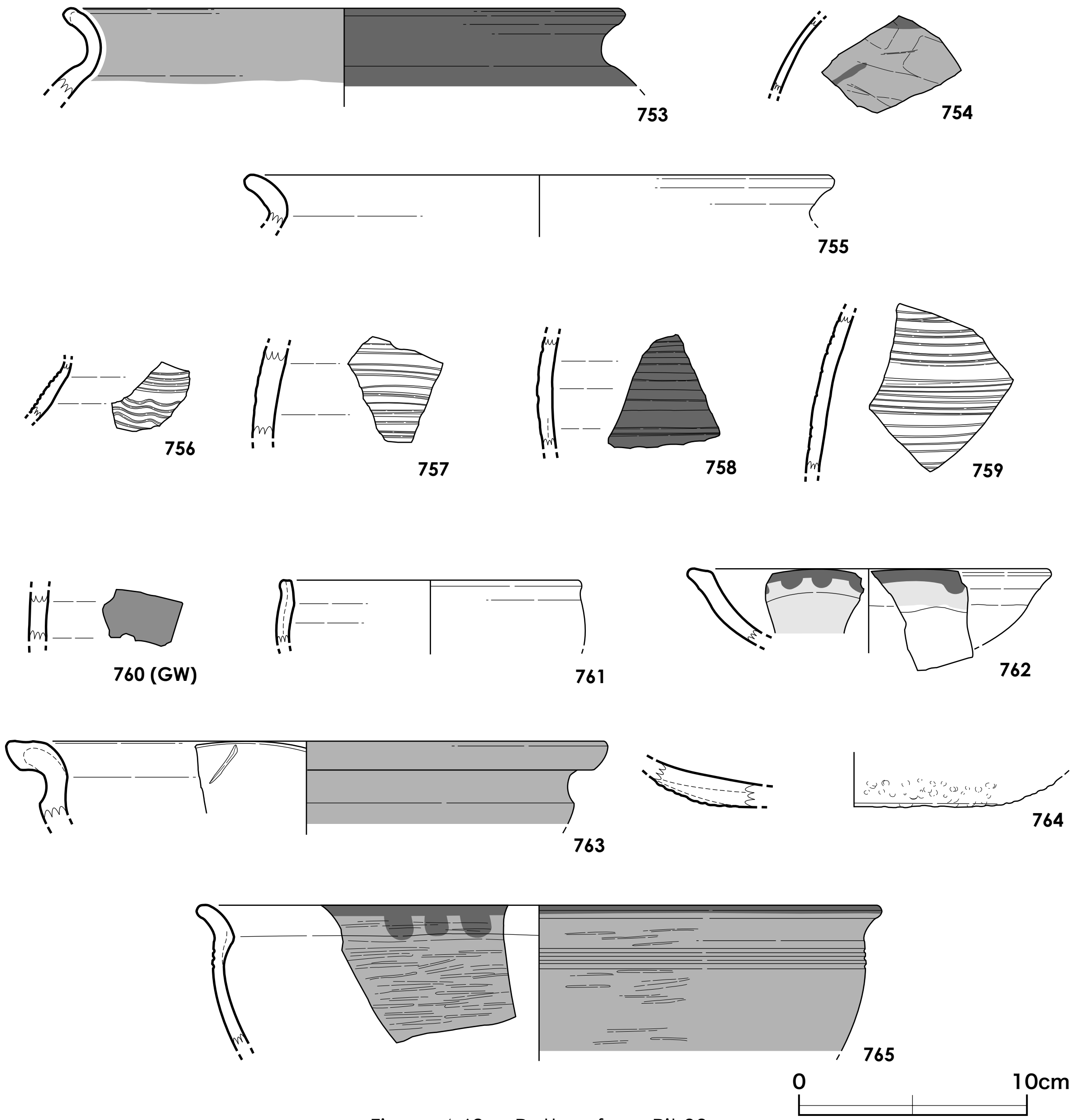


Figure 4.62 Pottery from Pit 33

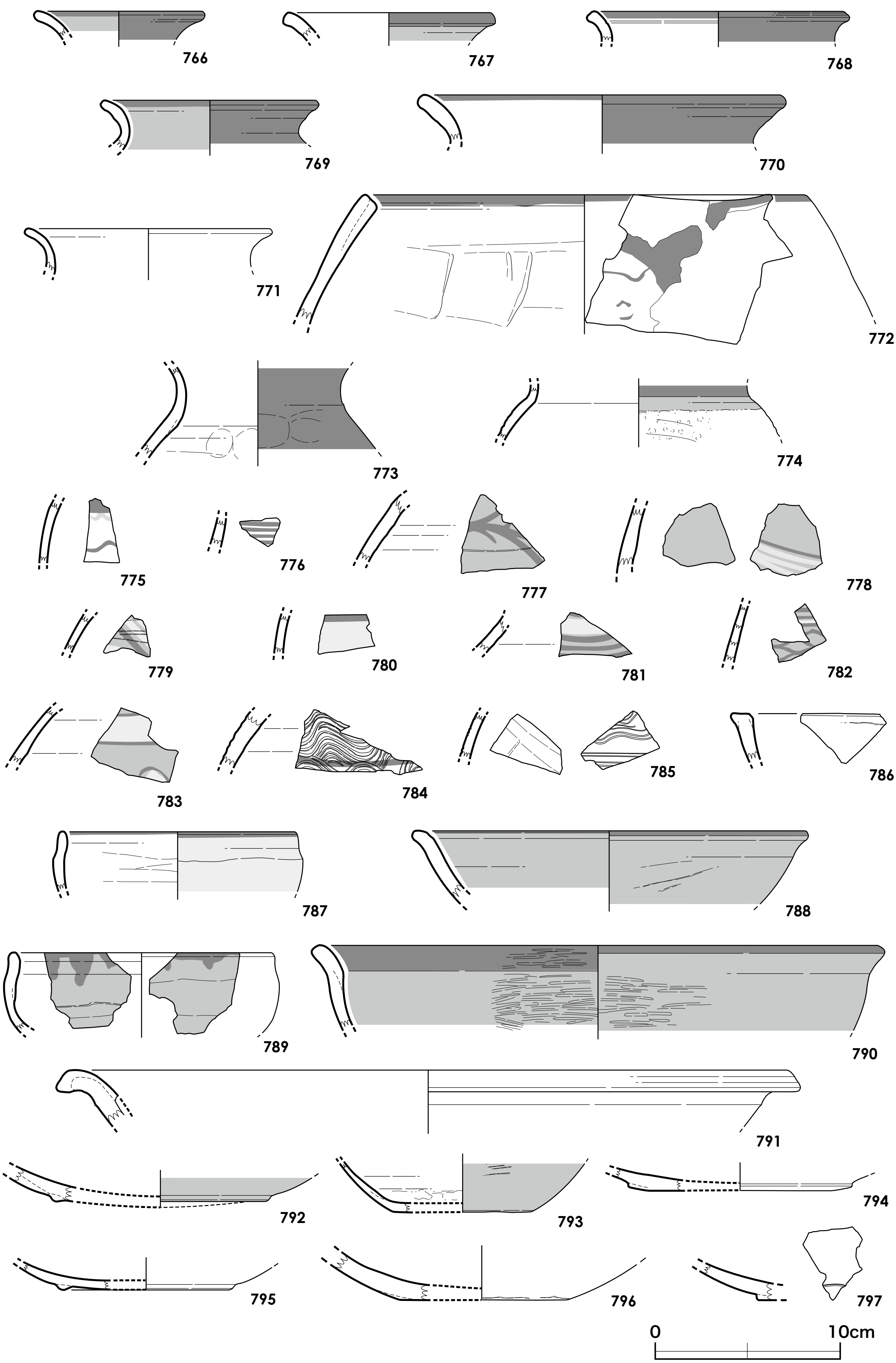


Figure 4.63 Pottery from Pit 33A

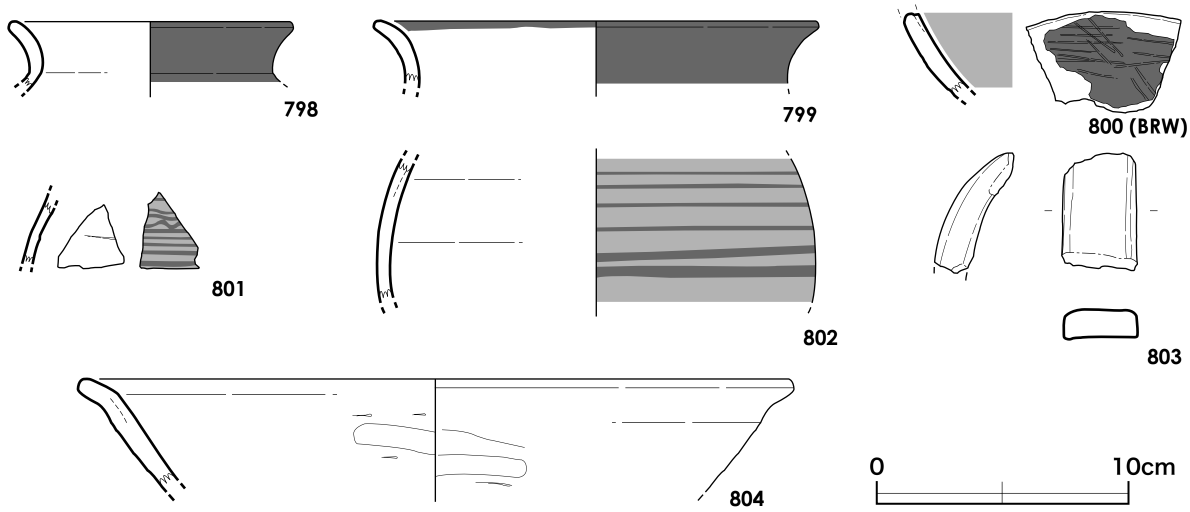


Figure 4.64 Pottery from Pit 33B

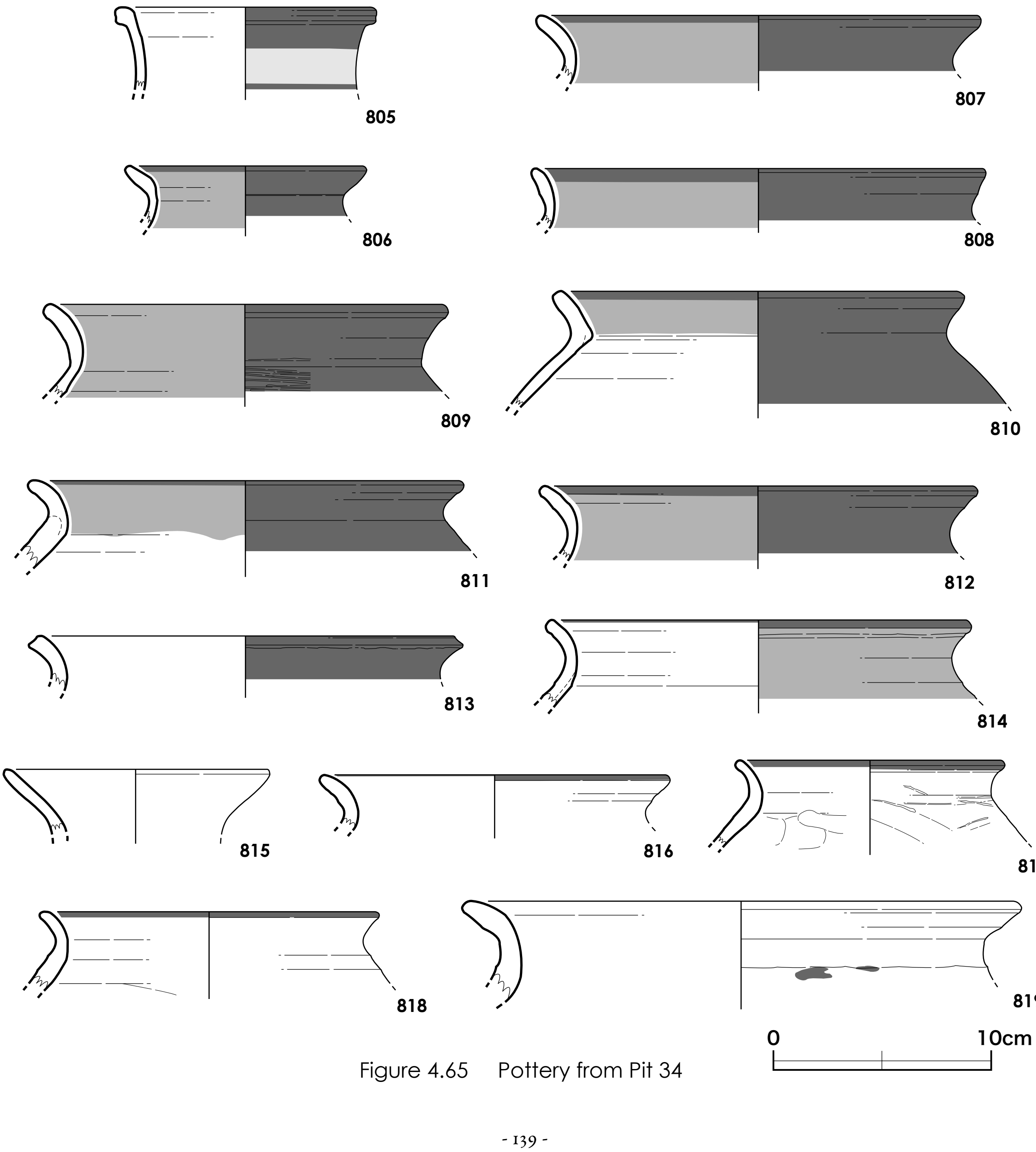


Figure 4.65 Pottery from Pit 34

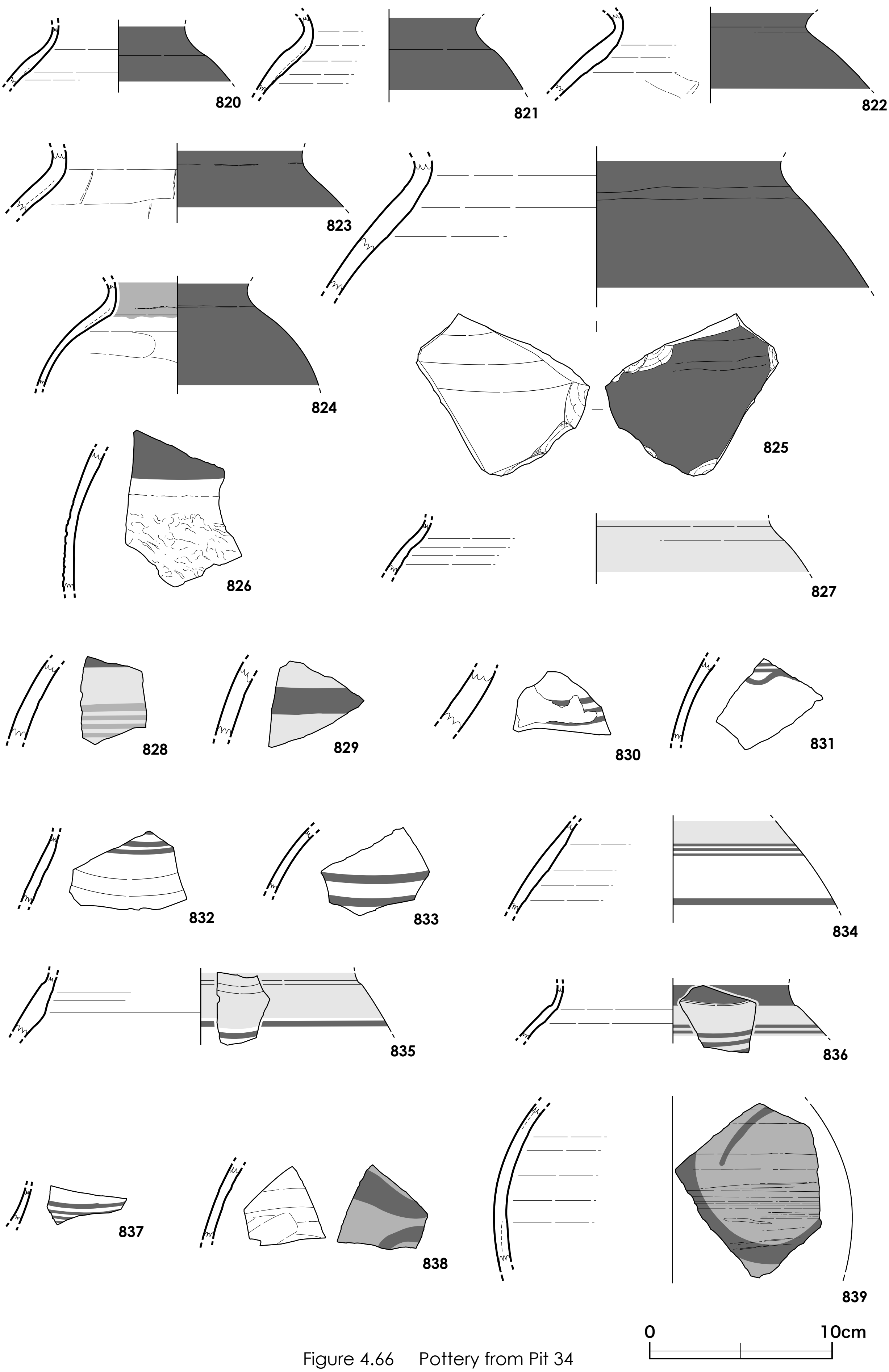


Figure 4.66 Pottery from Pit 34

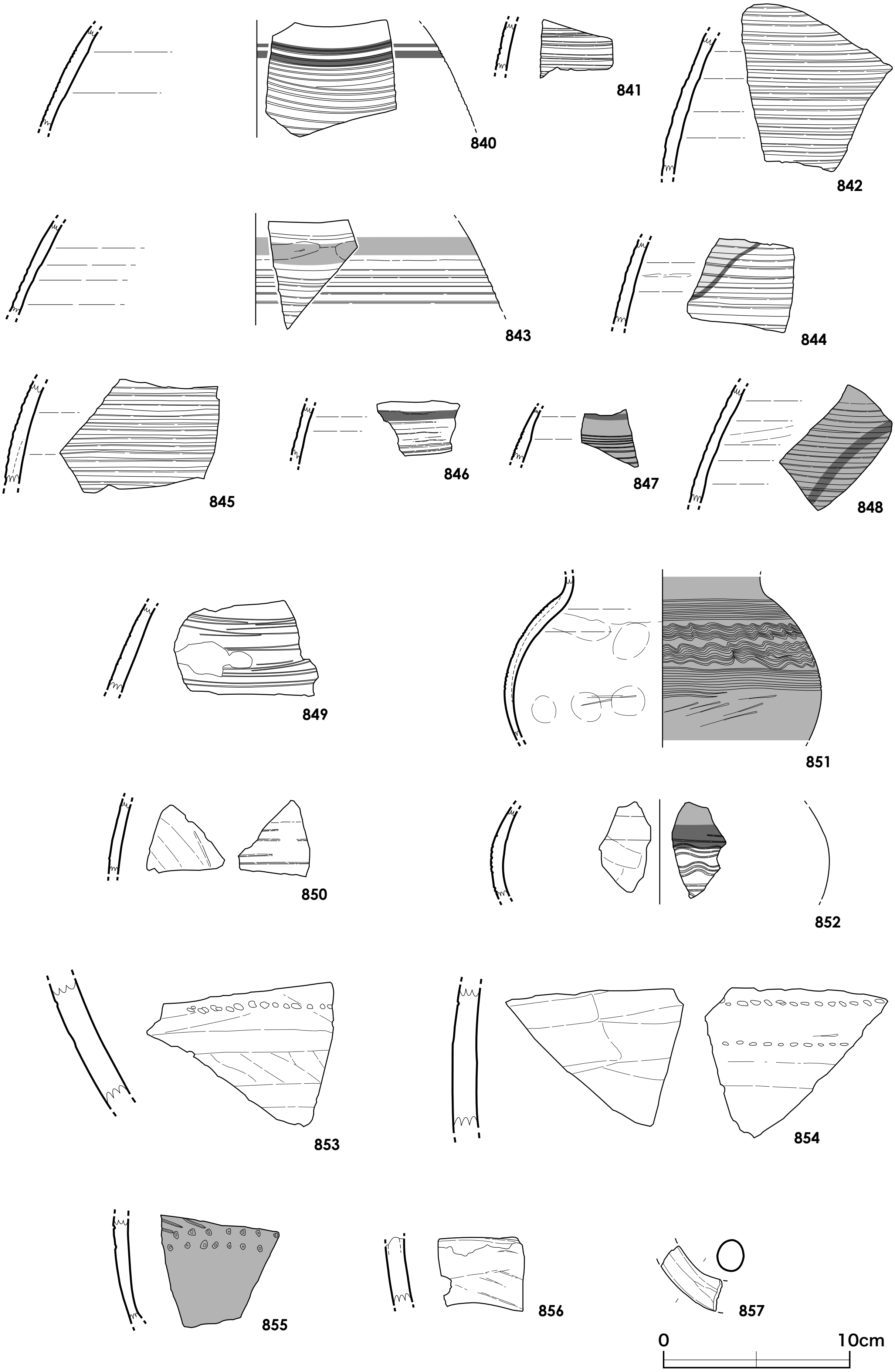


Figure 4.67 Pottery from Pit 34

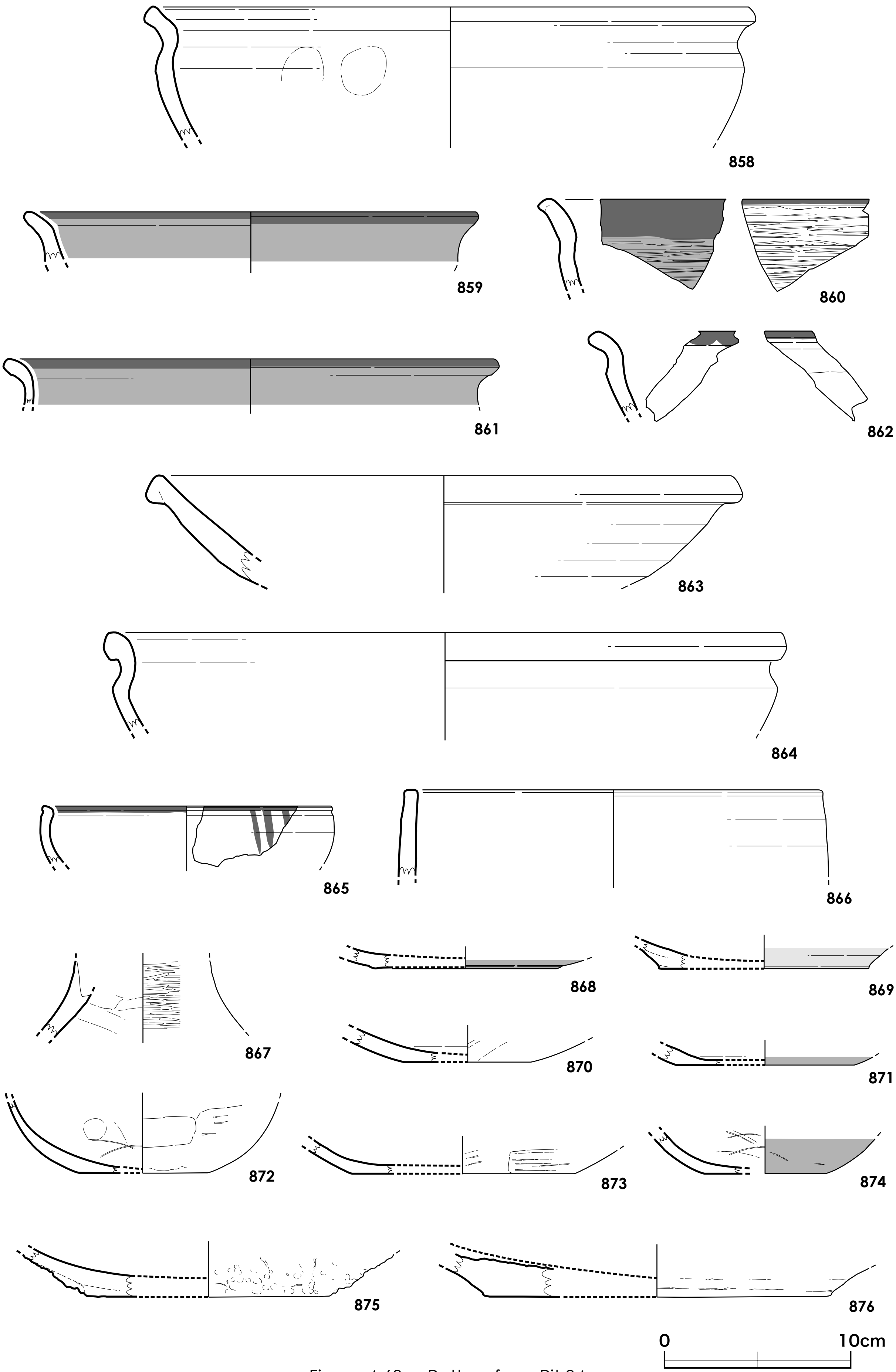


Figure 4.68 Pottery from Pit 34

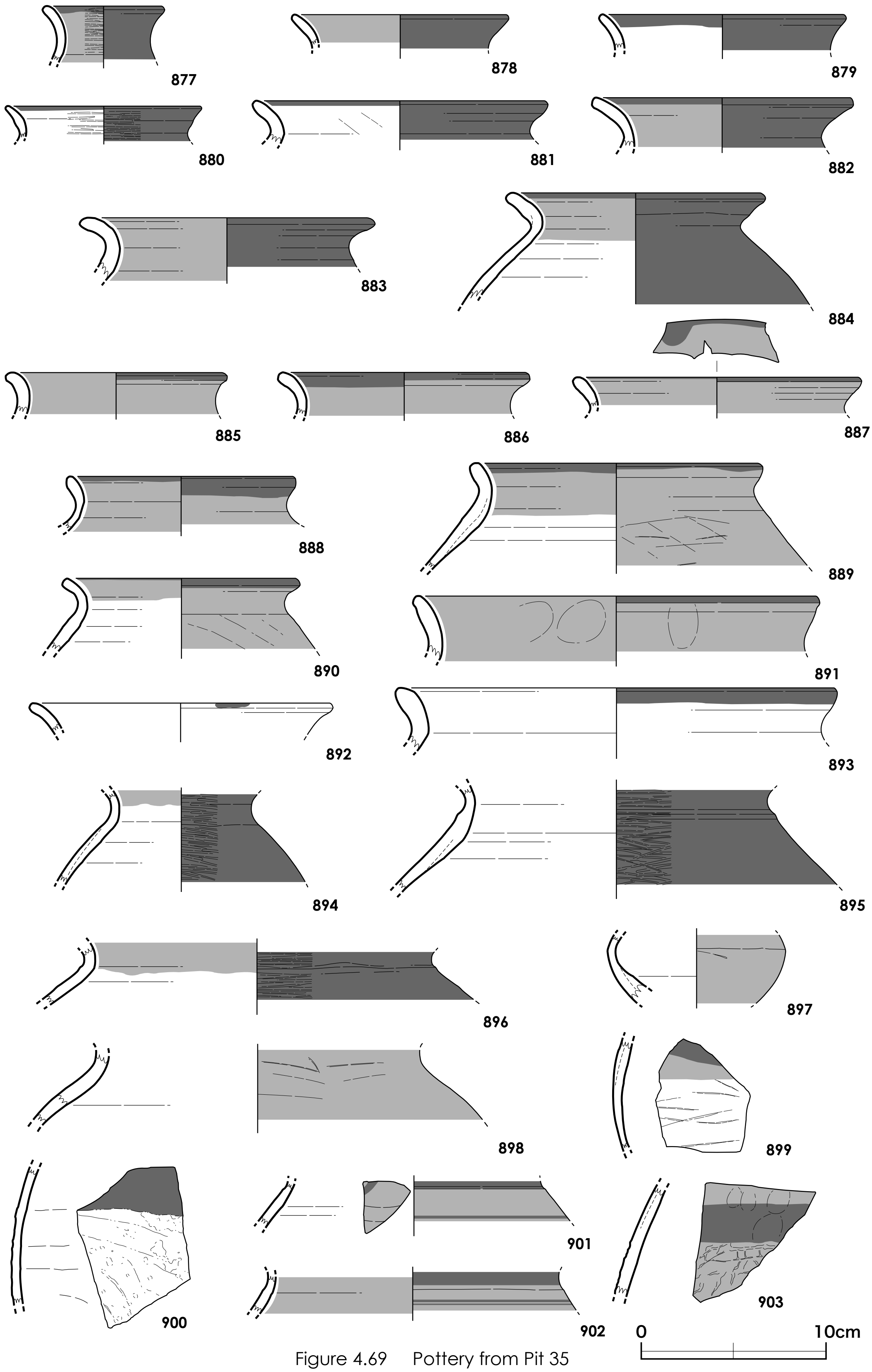


Figure 4.69 Pottery from Pit 35

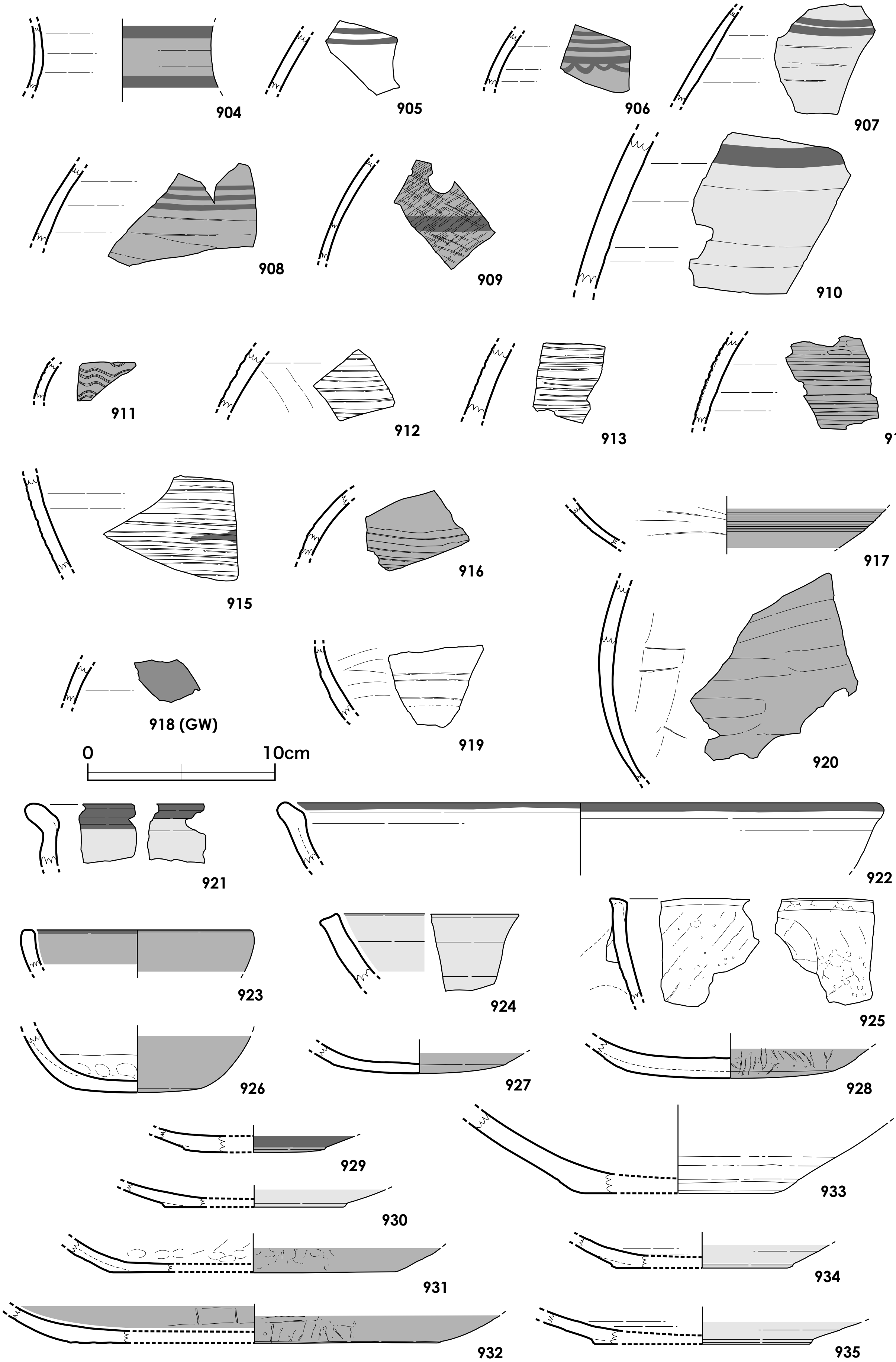


Figure 4.70 Pottery from Pit 35

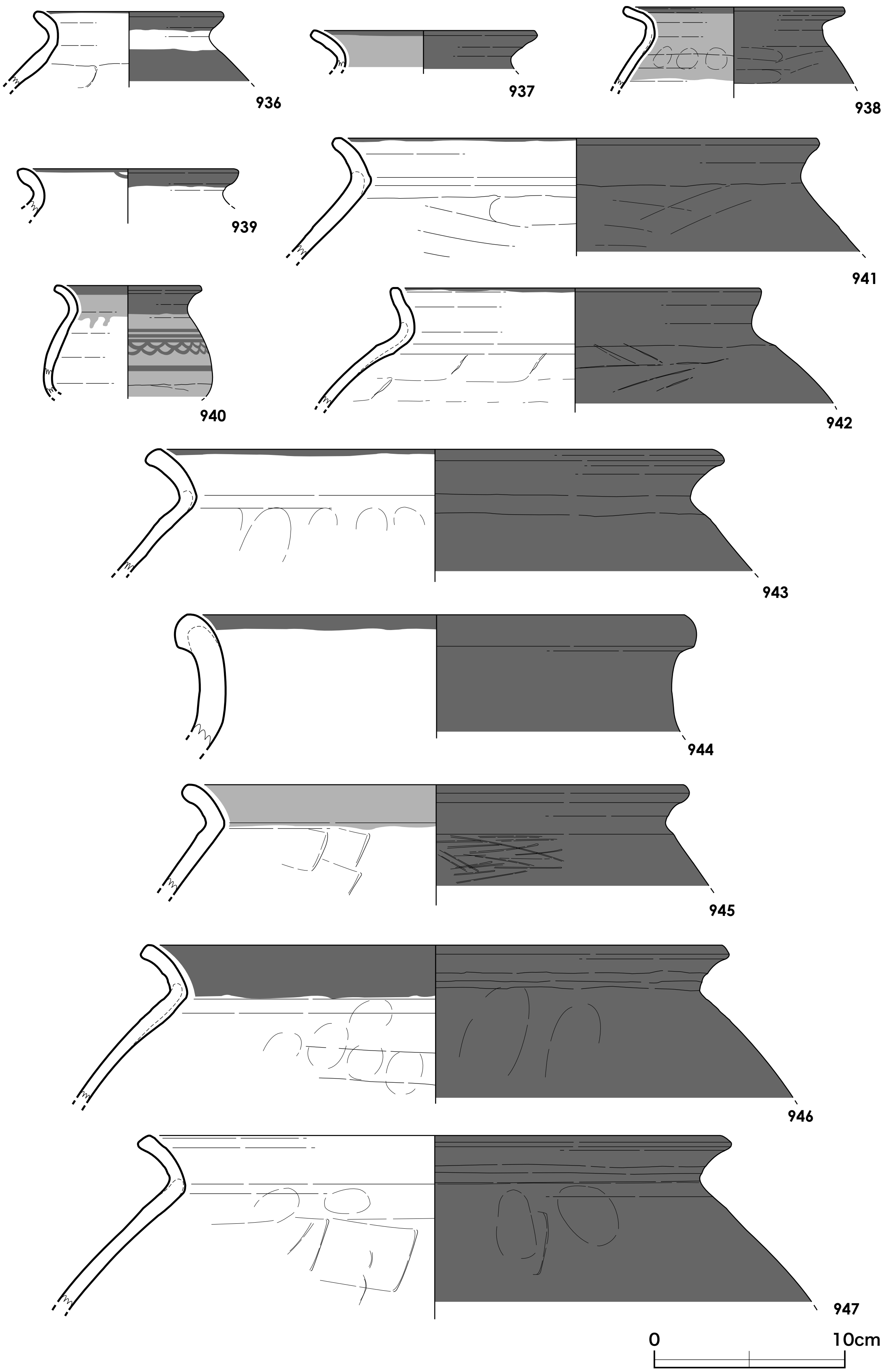


Figure 4.71 Pottery from Pit 36

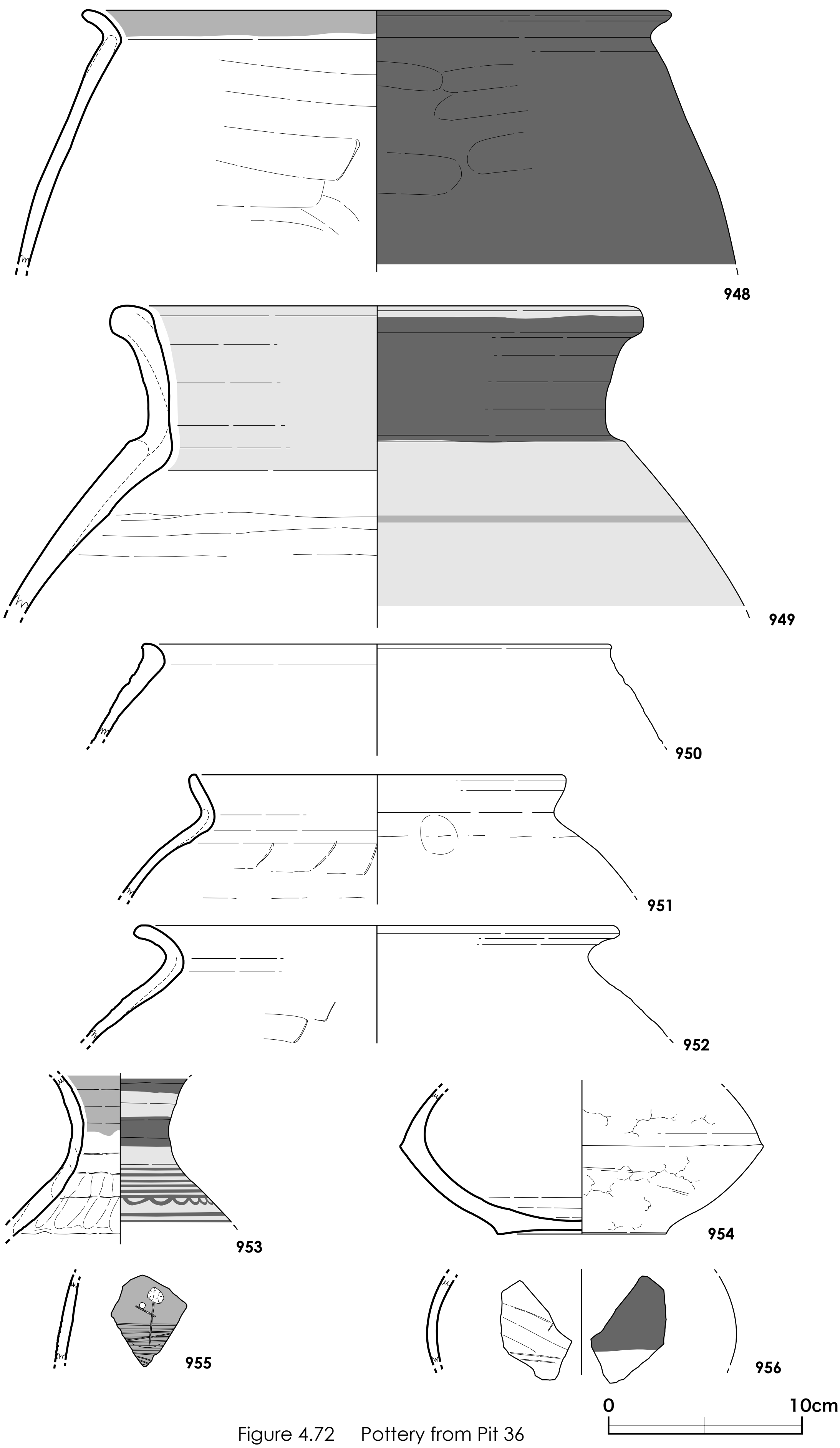


Figure 4.72 Pottery from Pit 36

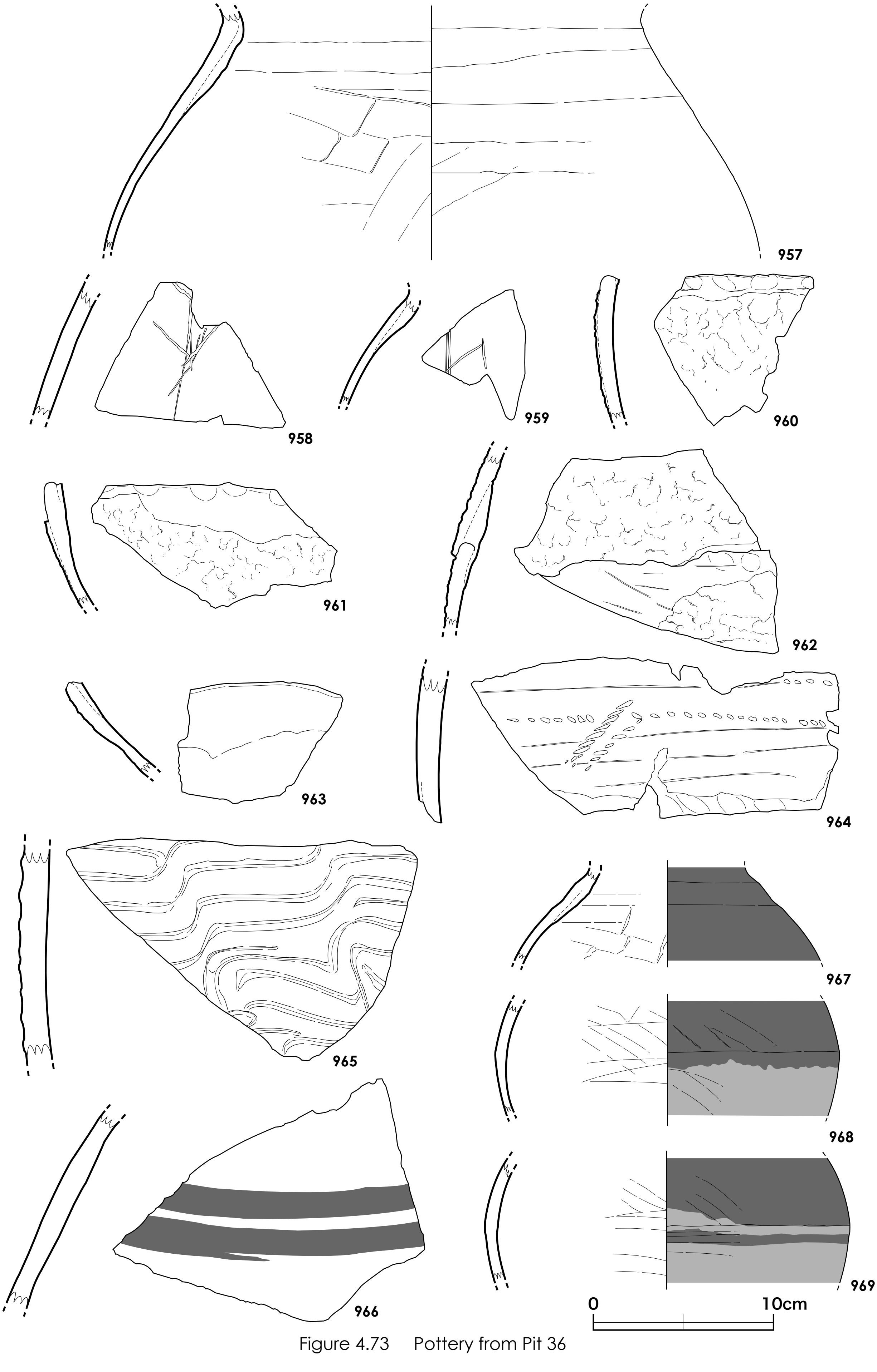


Figure 4.73 Pottery from Pit 36

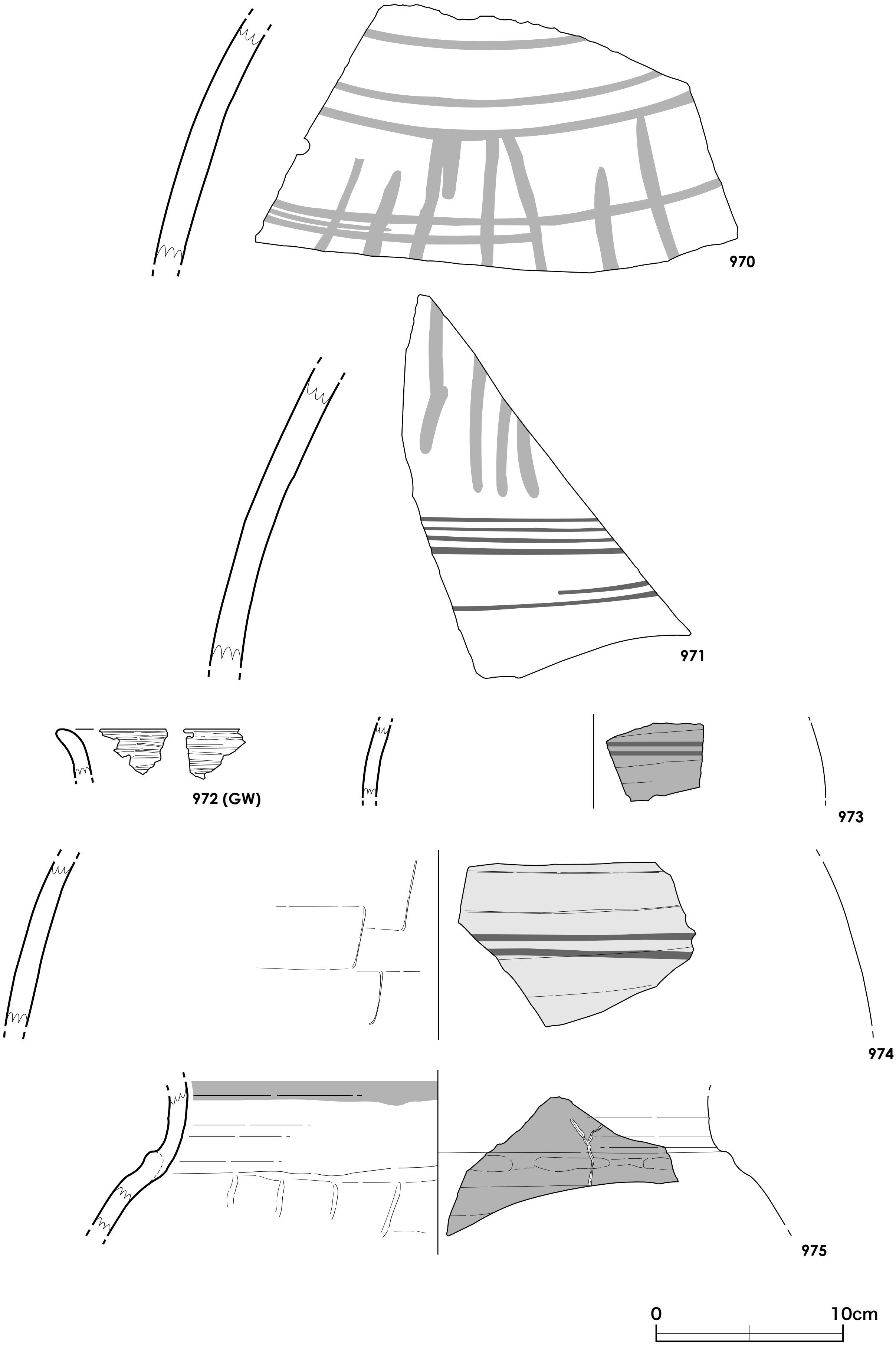


Figure 4.74   Pottery from Pit 36

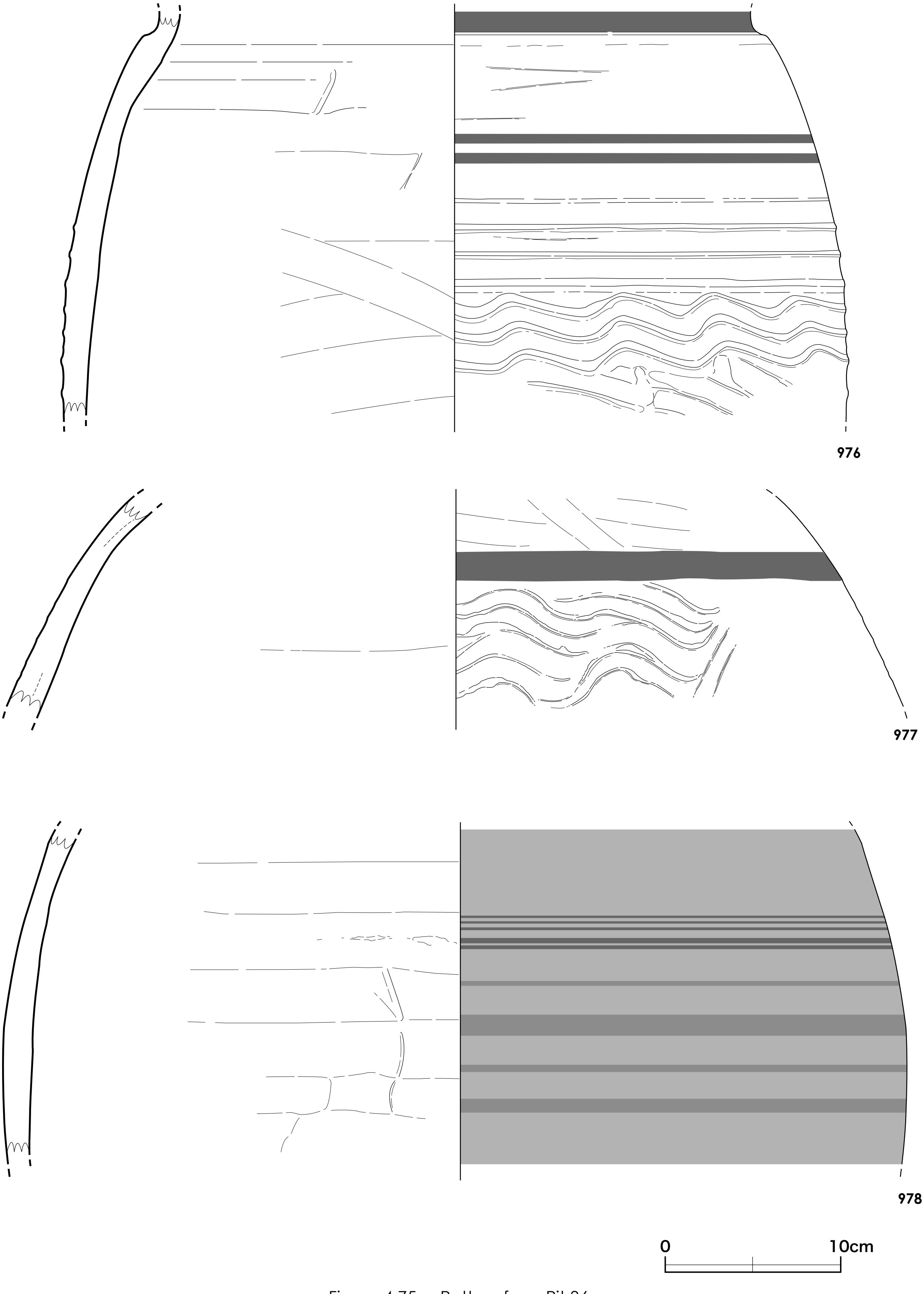


Figure 4.75 Pottery from Pit 36

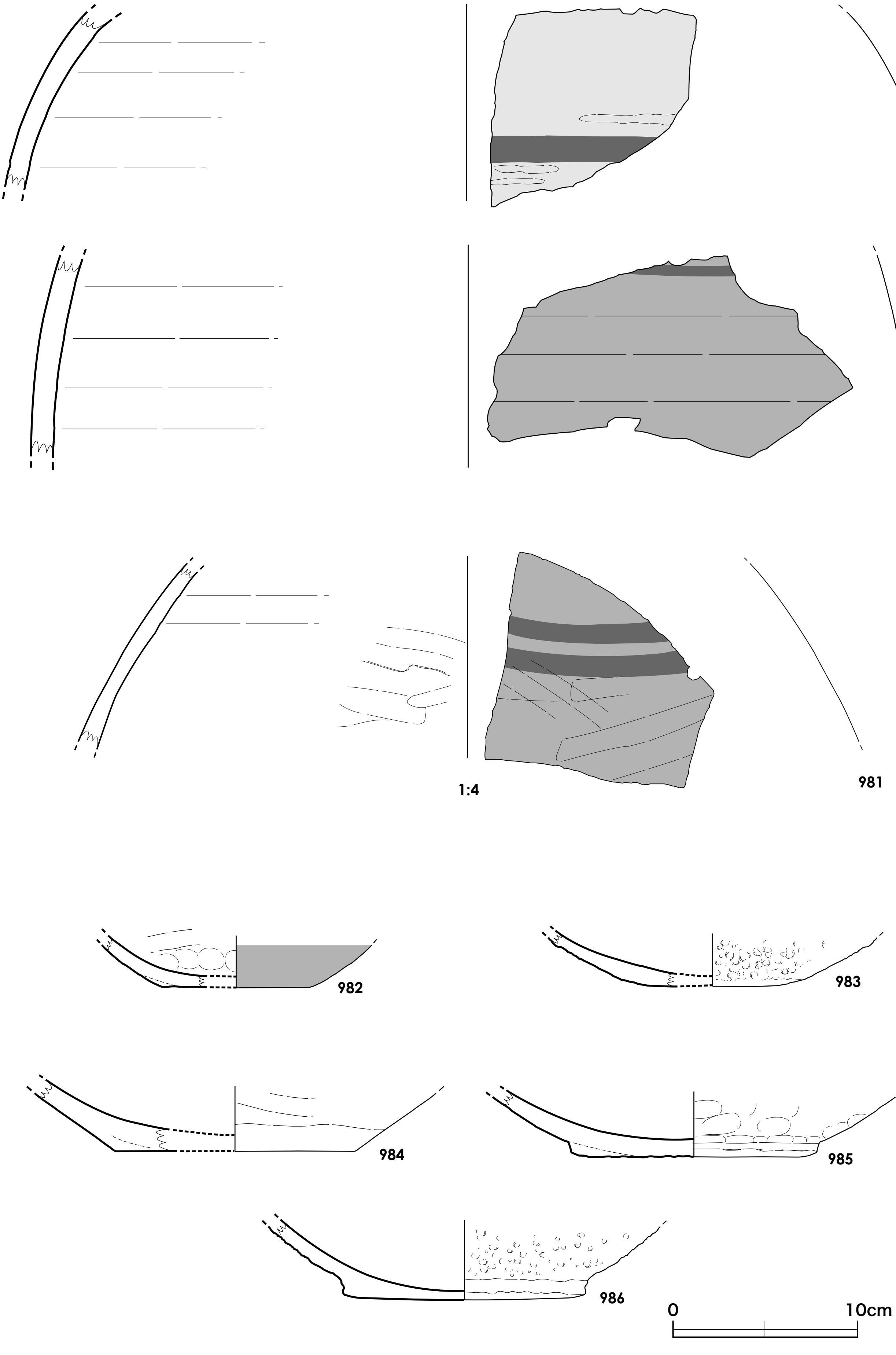


Figure 4.76   Pottery from Pit 36

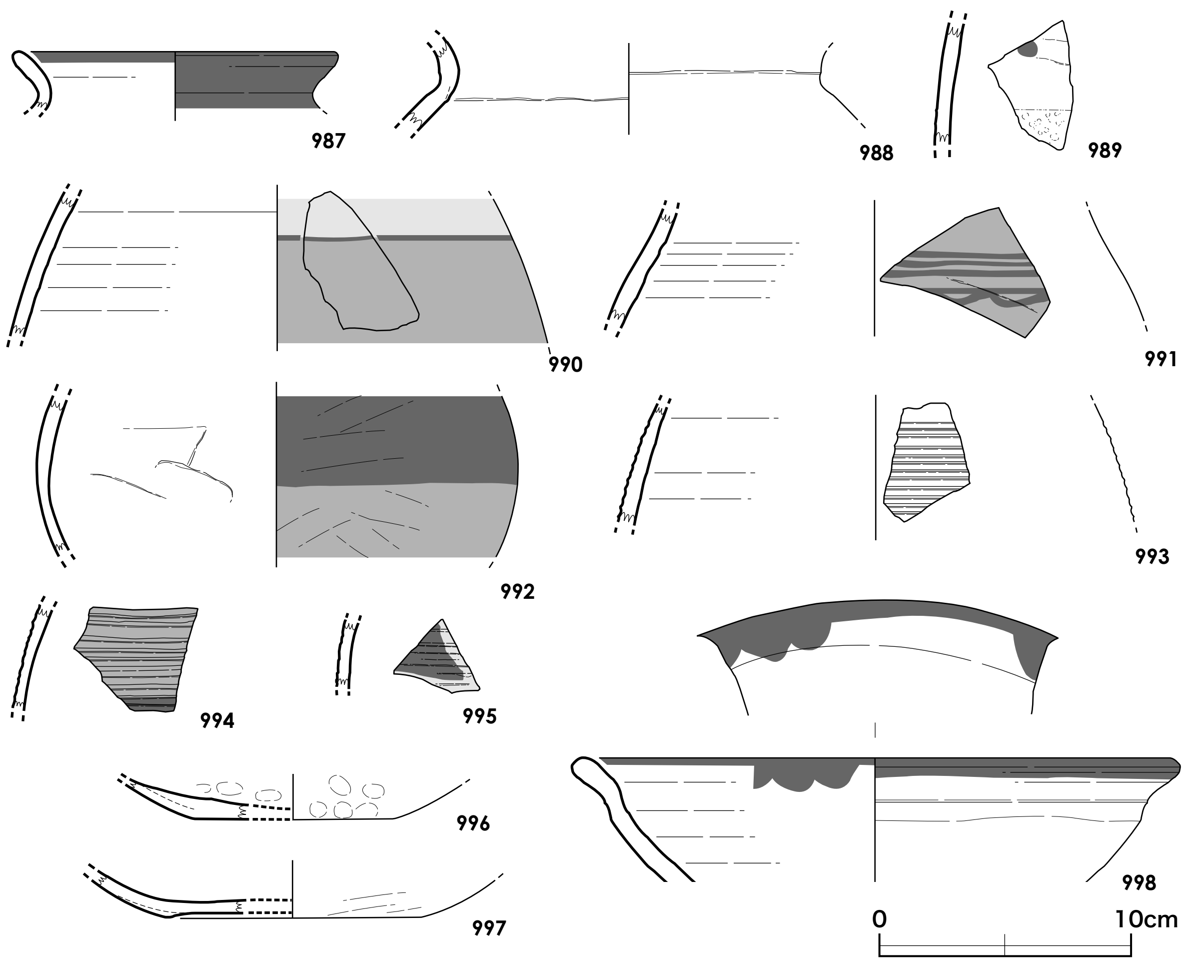


Figure 4.77 Pottery from Pit 38

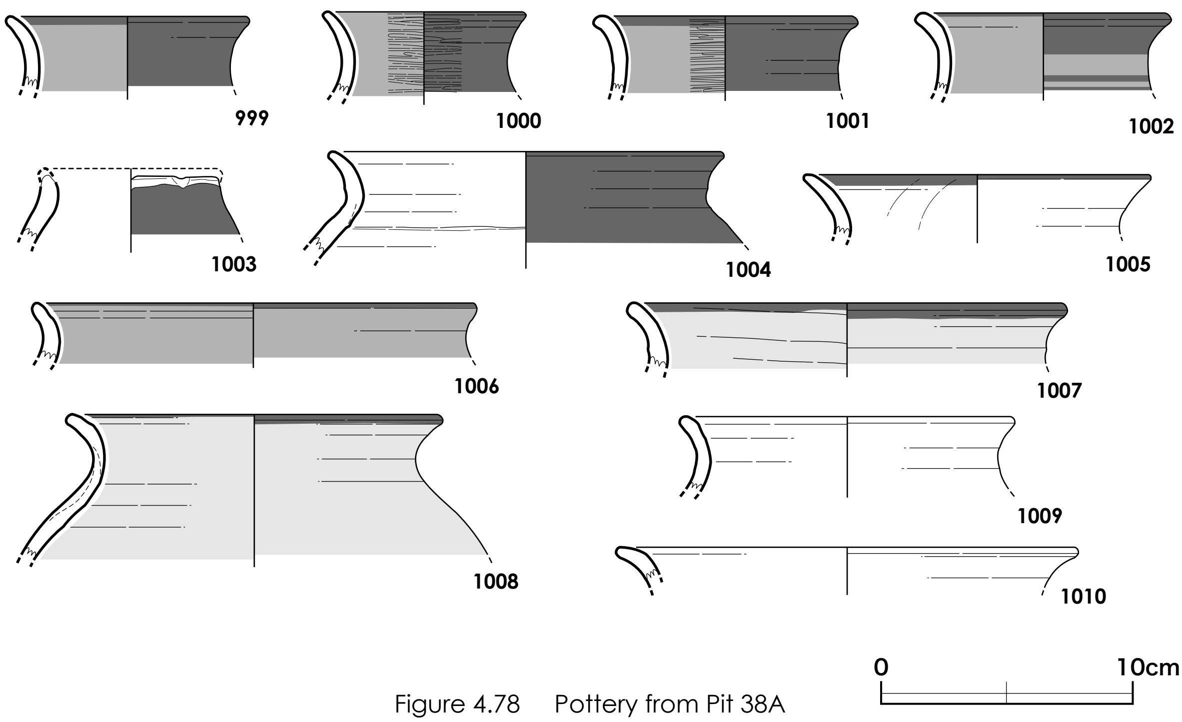


Figure 4.78 Pottery from Pit 38A

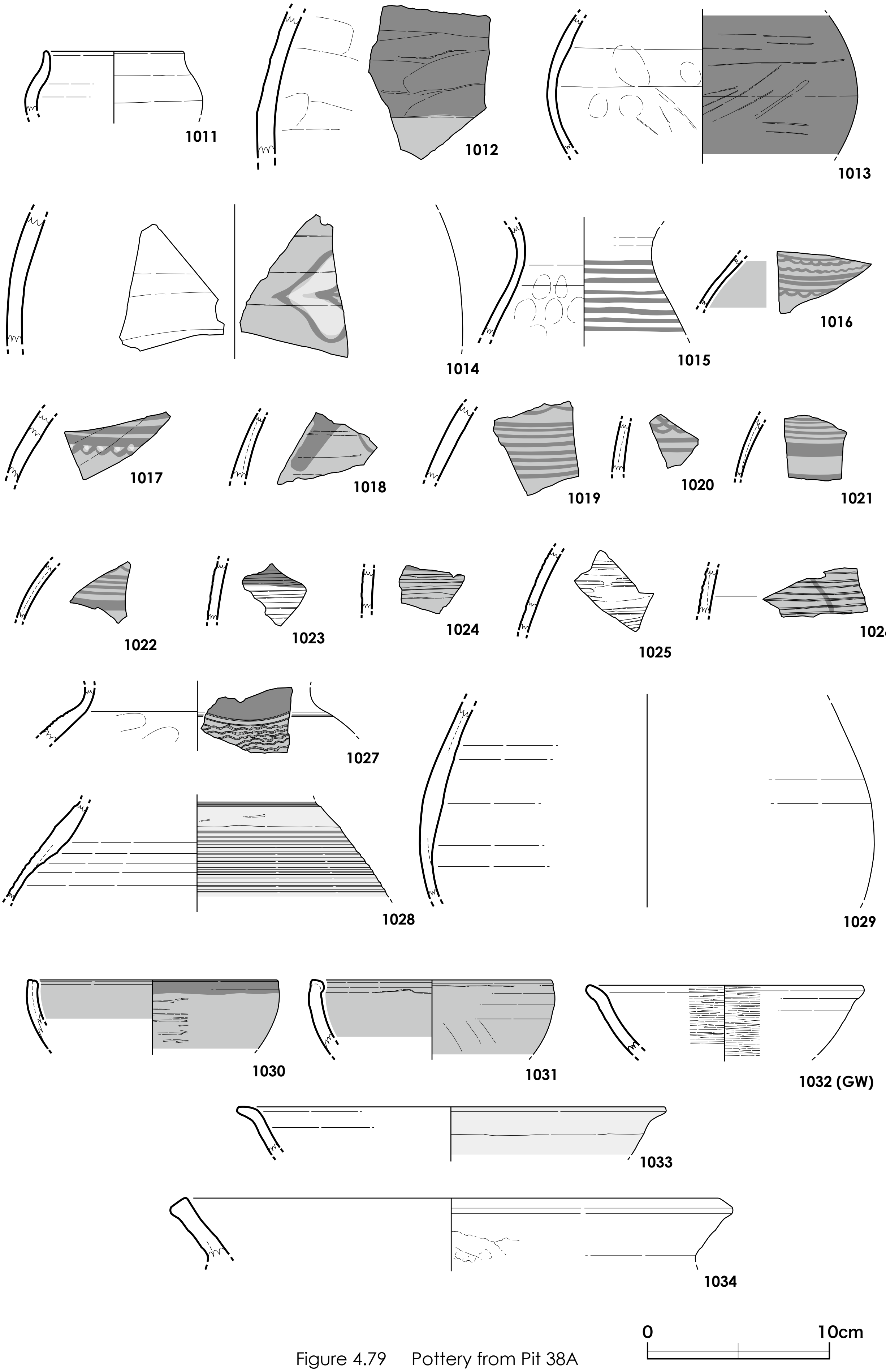


Figure 4.79 Pottery from Pit 38A

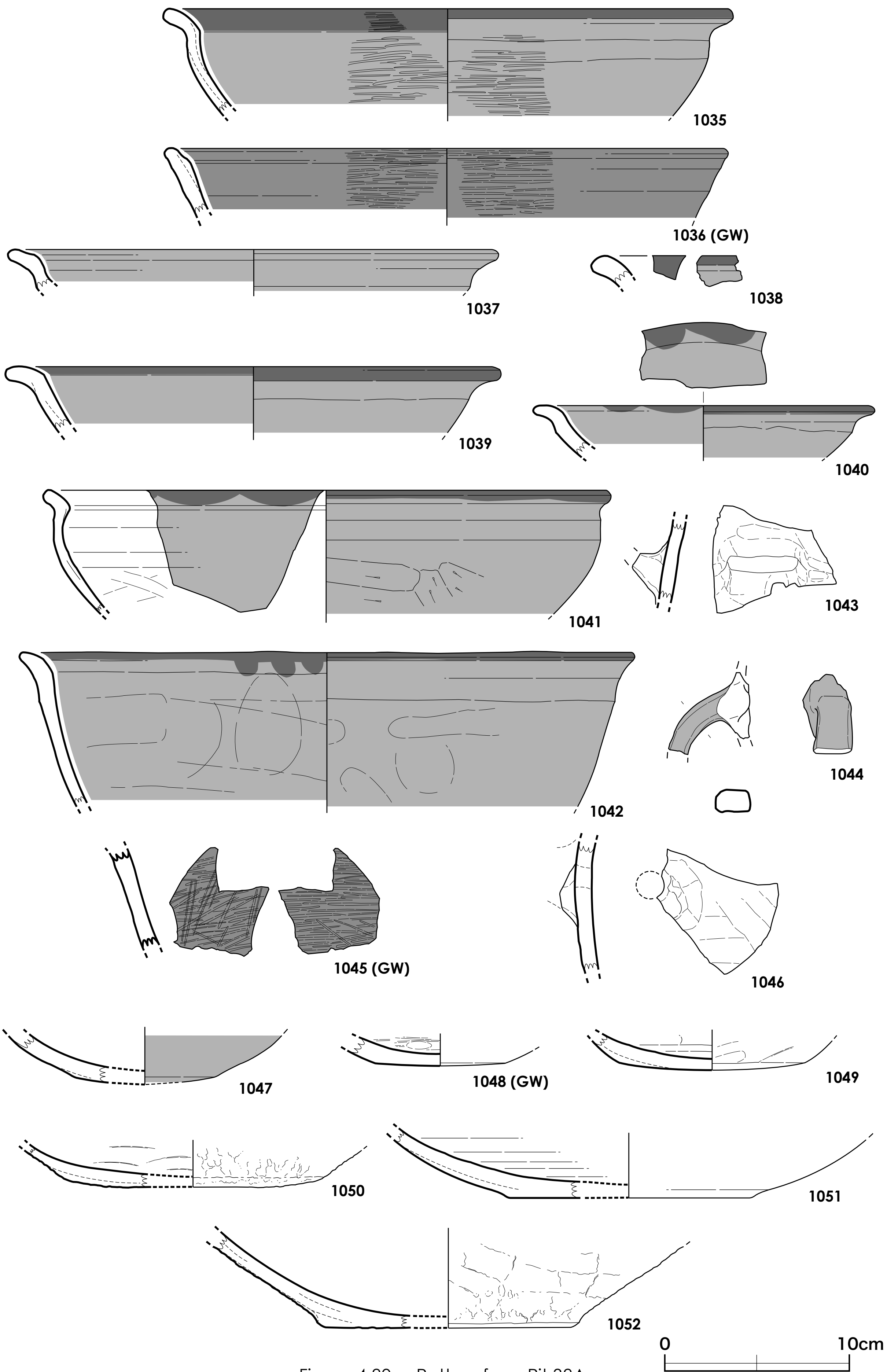


Figure 4.80 Pottery from Pit 38A

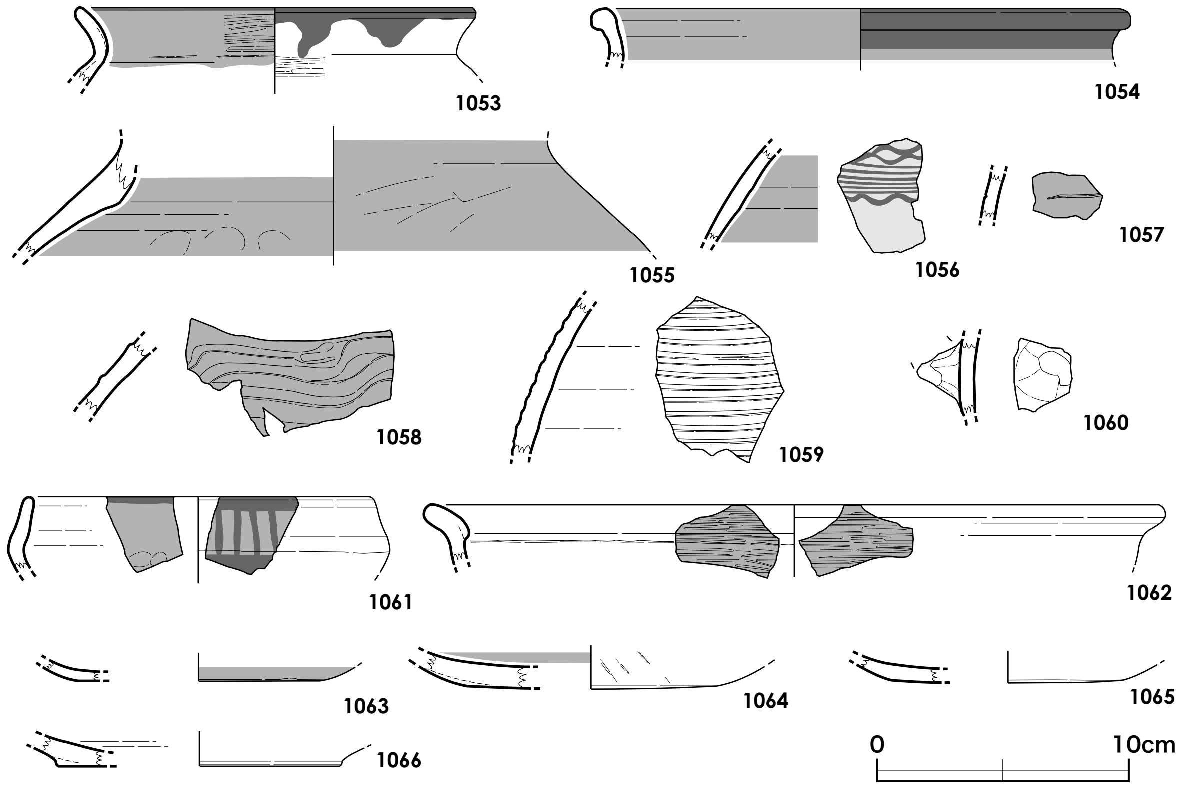


Figure 4.81 Pottery from Pit 39

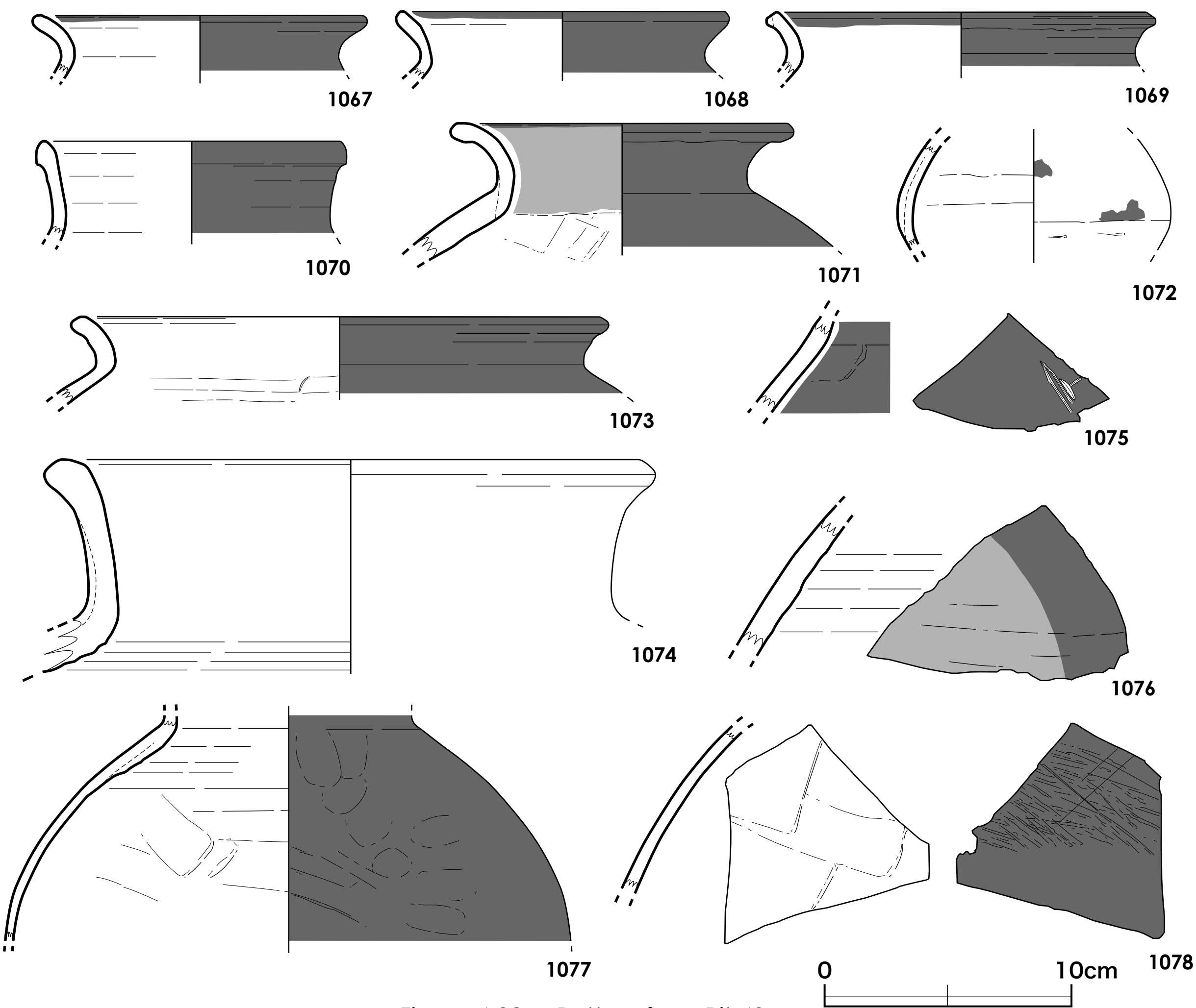


Figure 4.82 Pottery from Pit 40

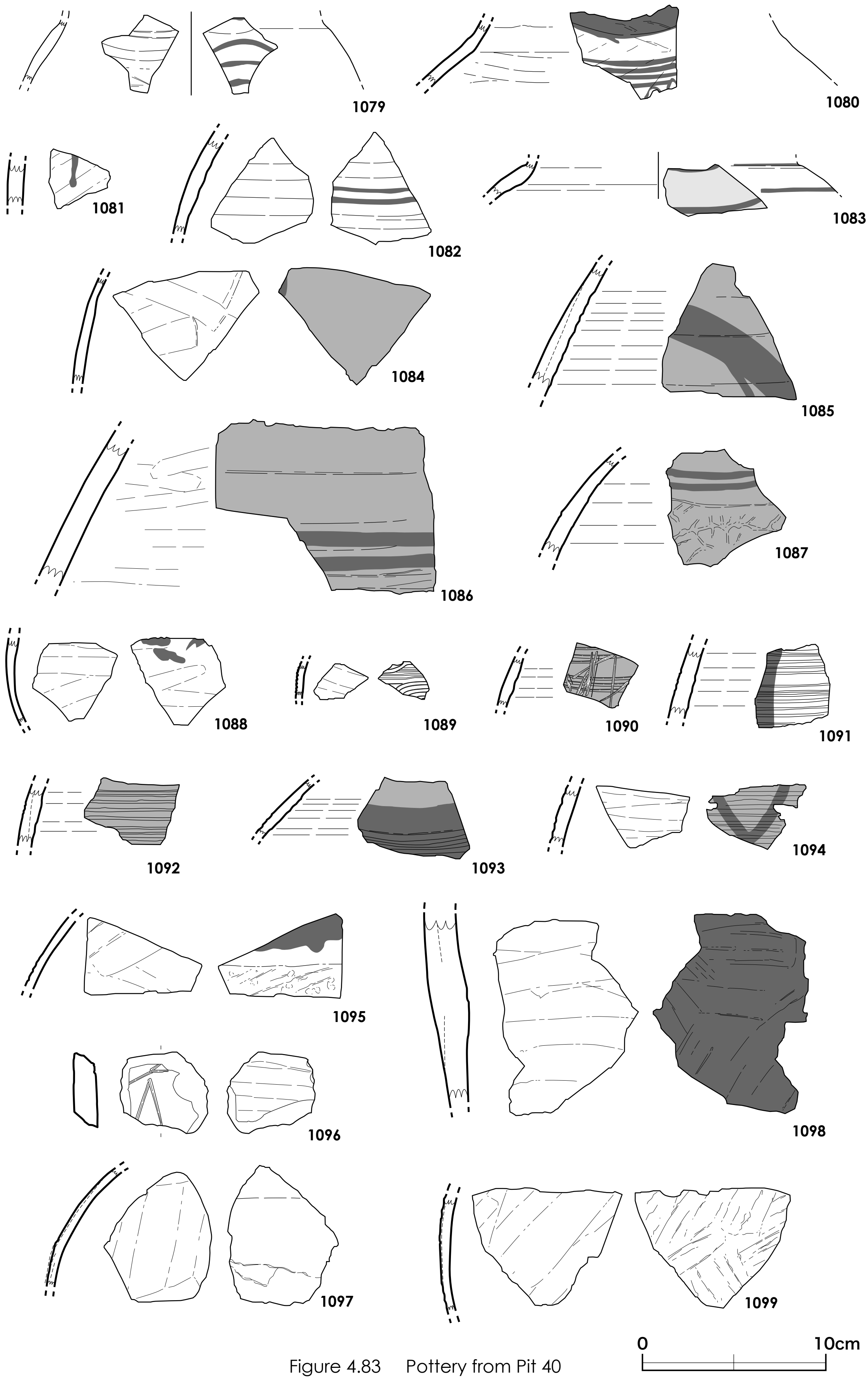


Figure 4.83 Pottery from Pit 40

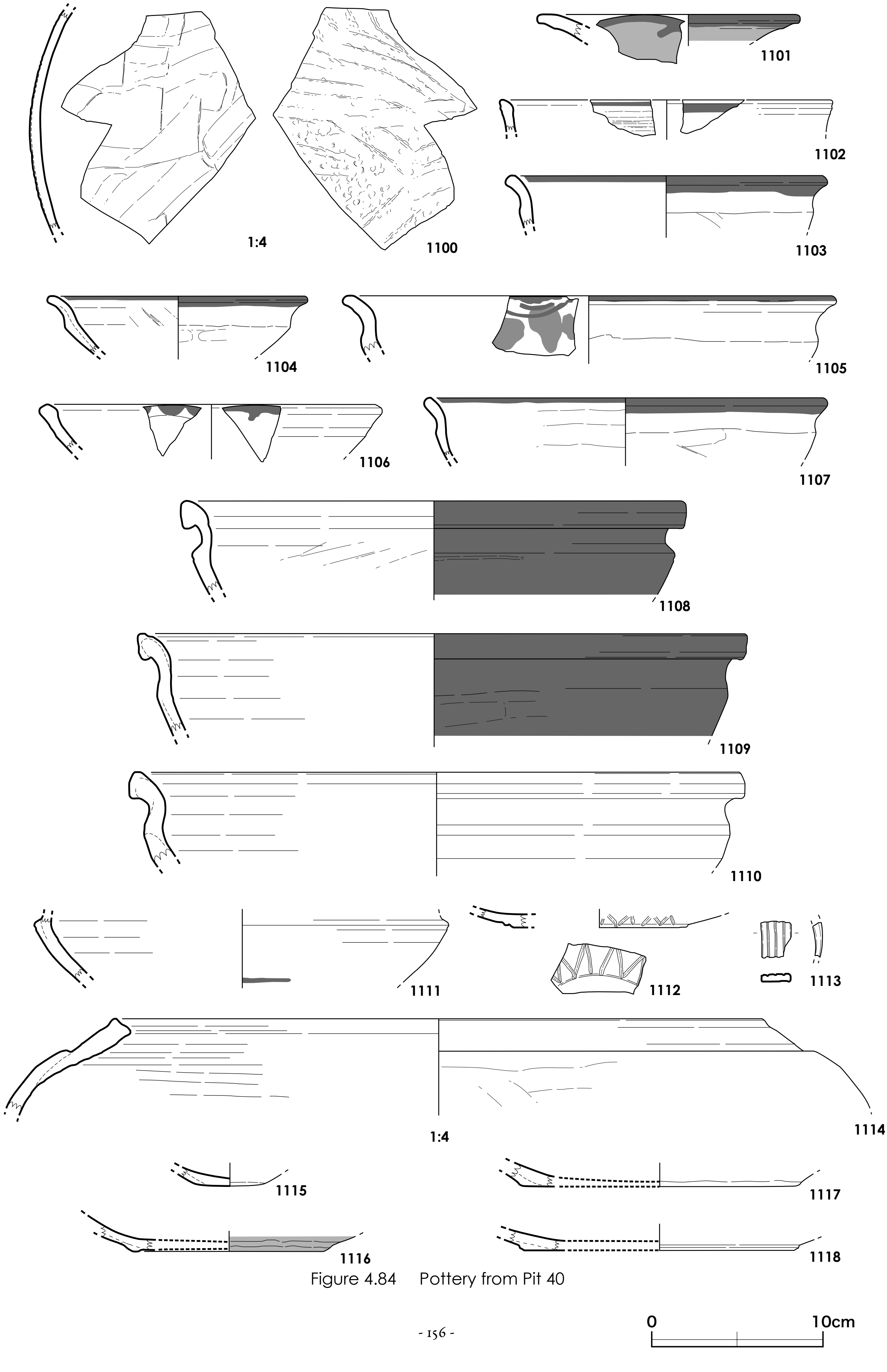


Figure 4.84   Pottery from Pit 40

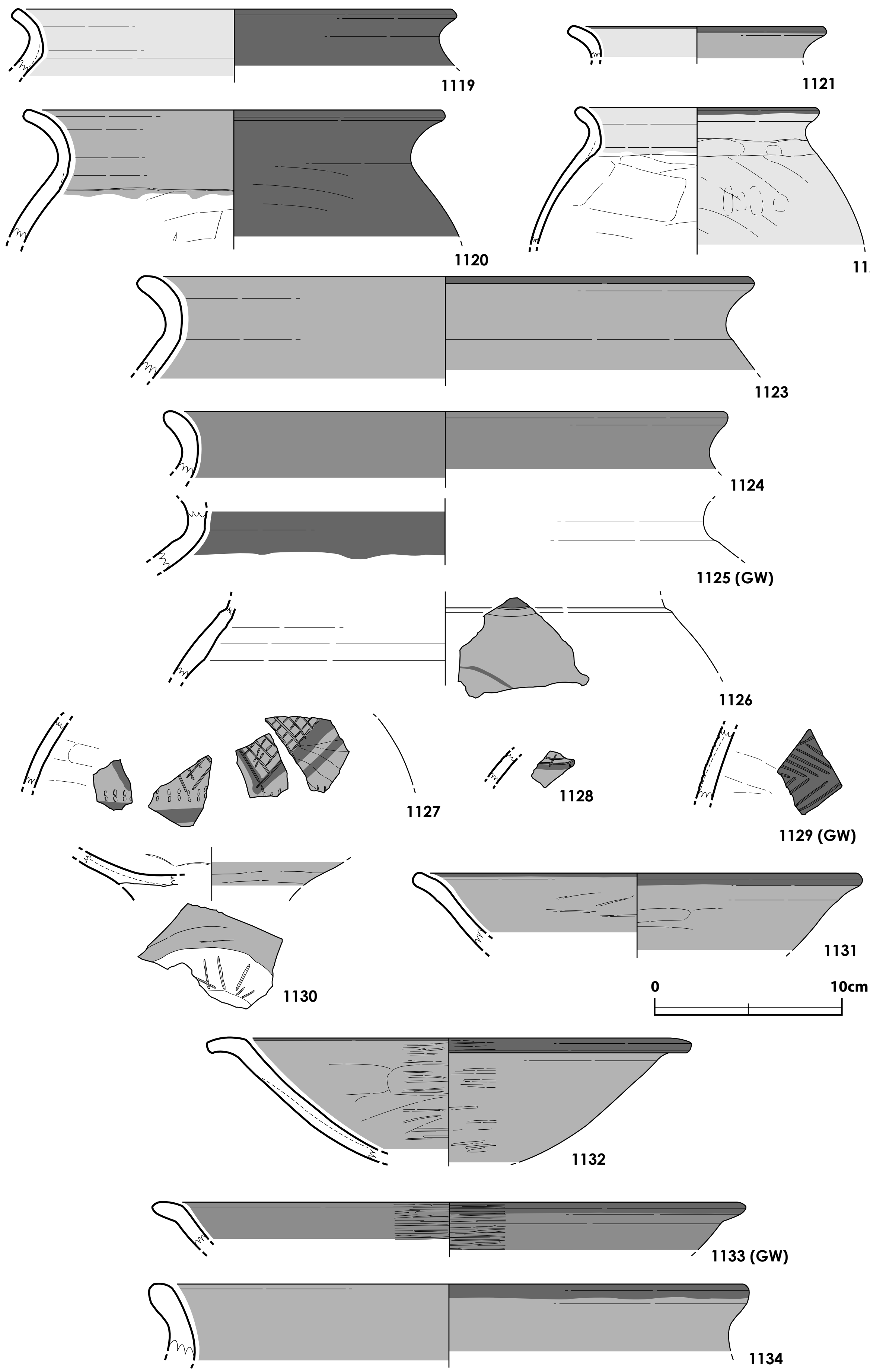


Figure 4.85 Pottery from Pit 43

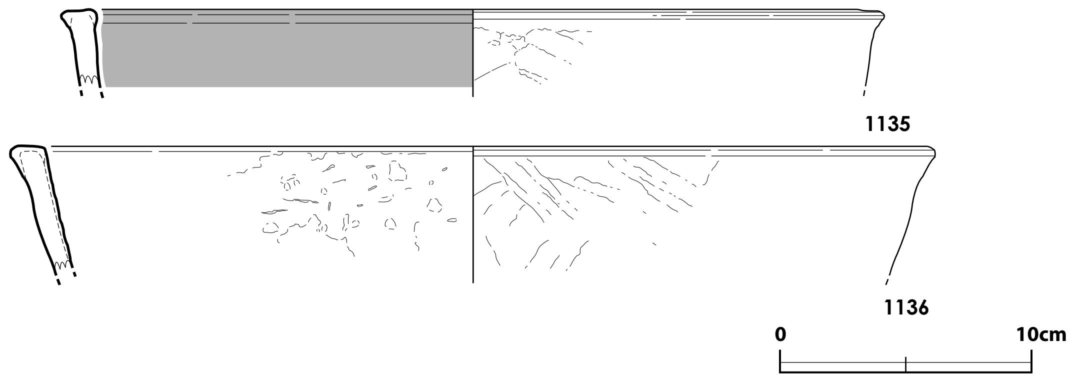


Figure 4.86   Pottery from Pit 43

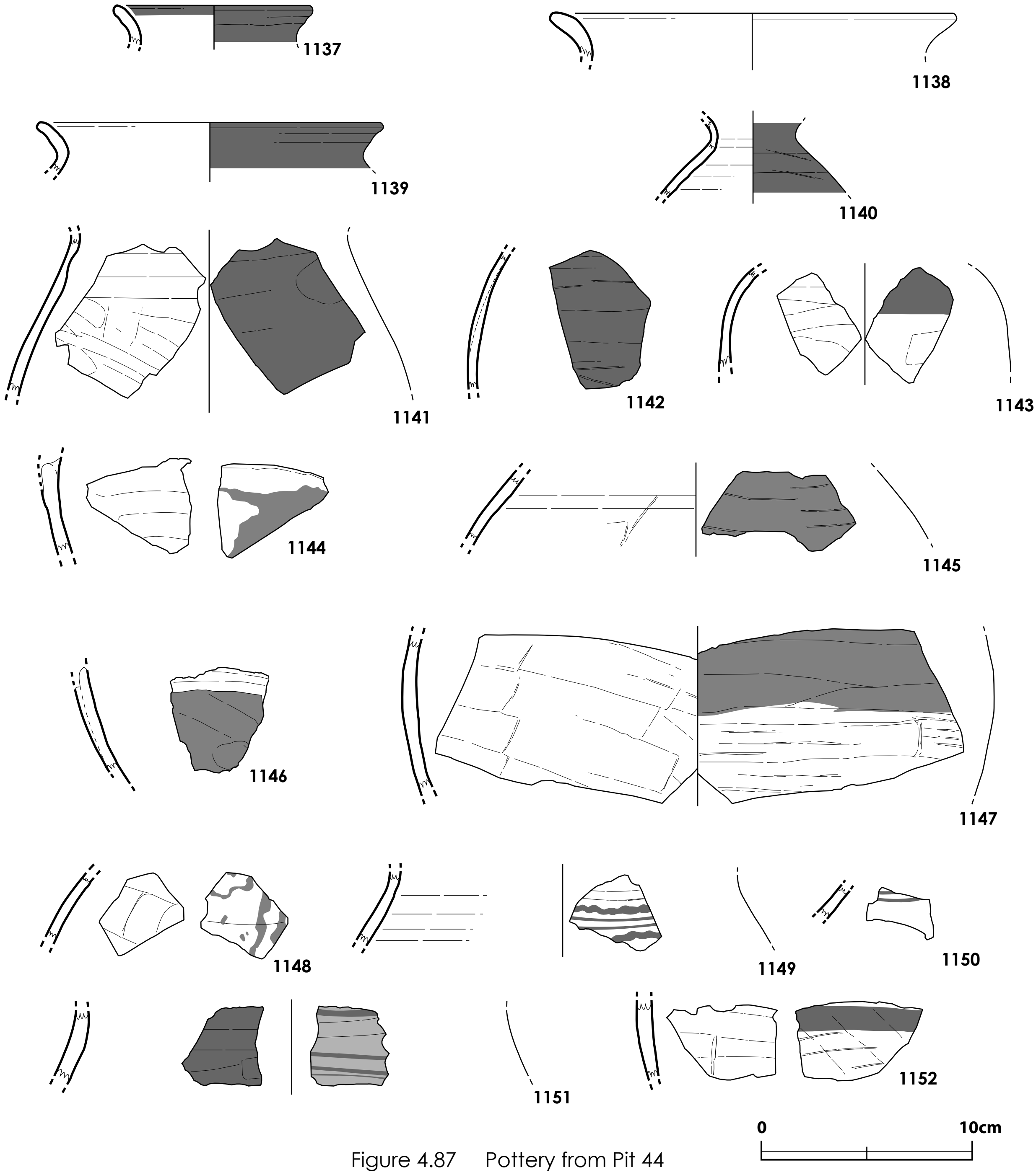


Figure 4.87   Pottery from Pit 44

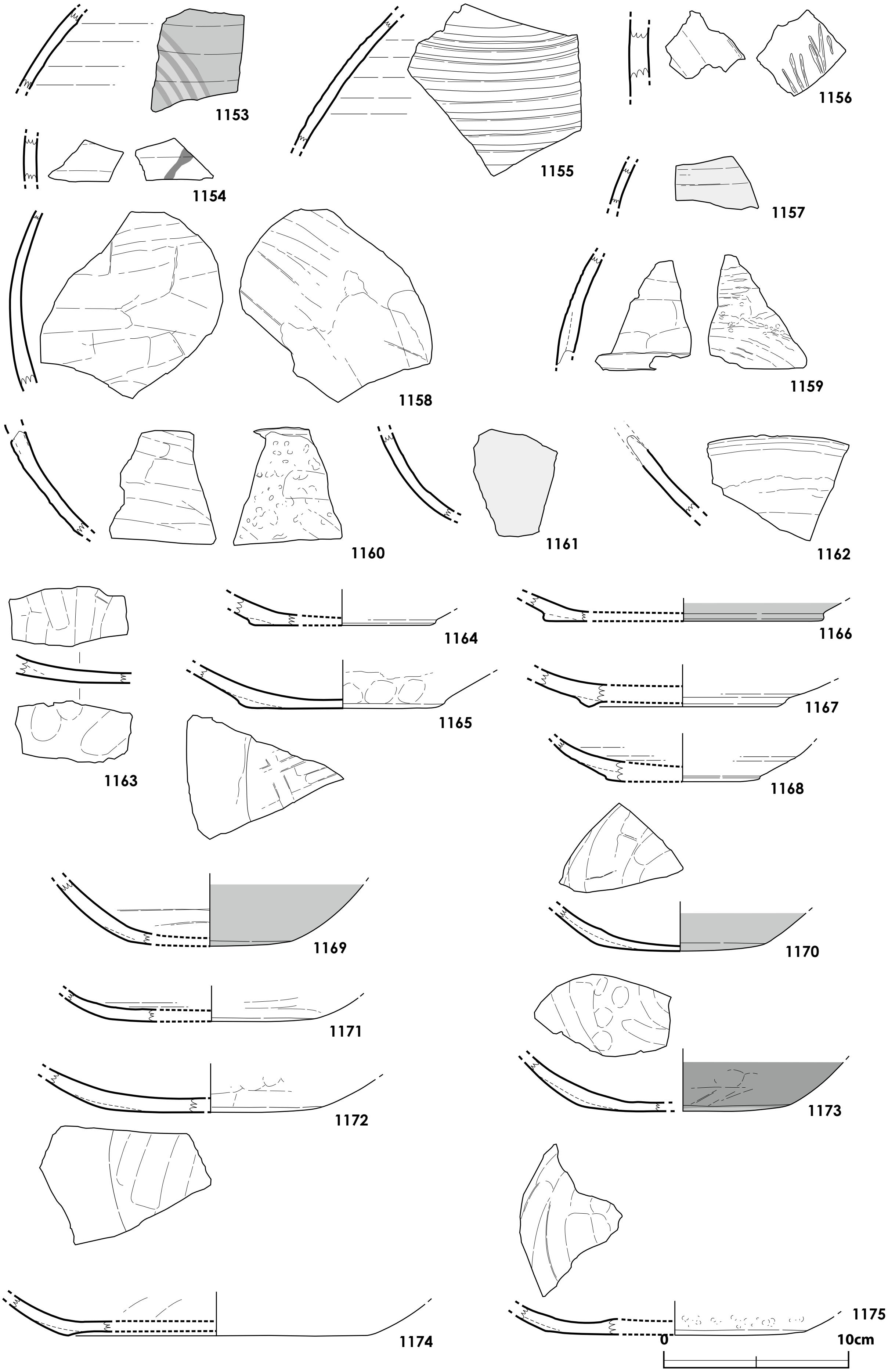


Figure 4.88 Pottery from Pit 44

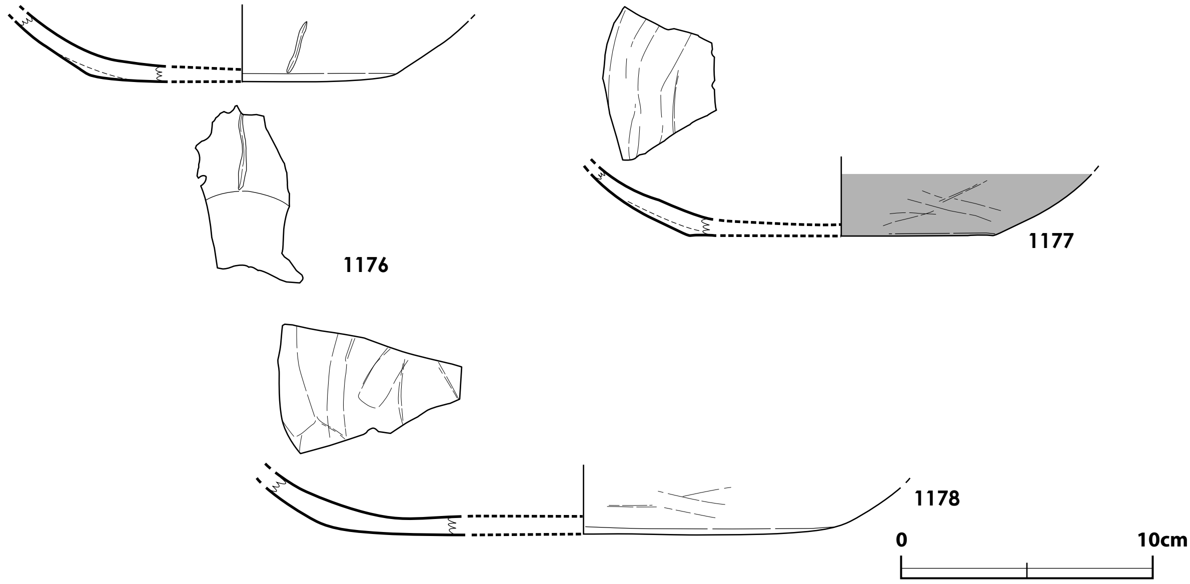


Figure 4.89 Pottery from Pit 44

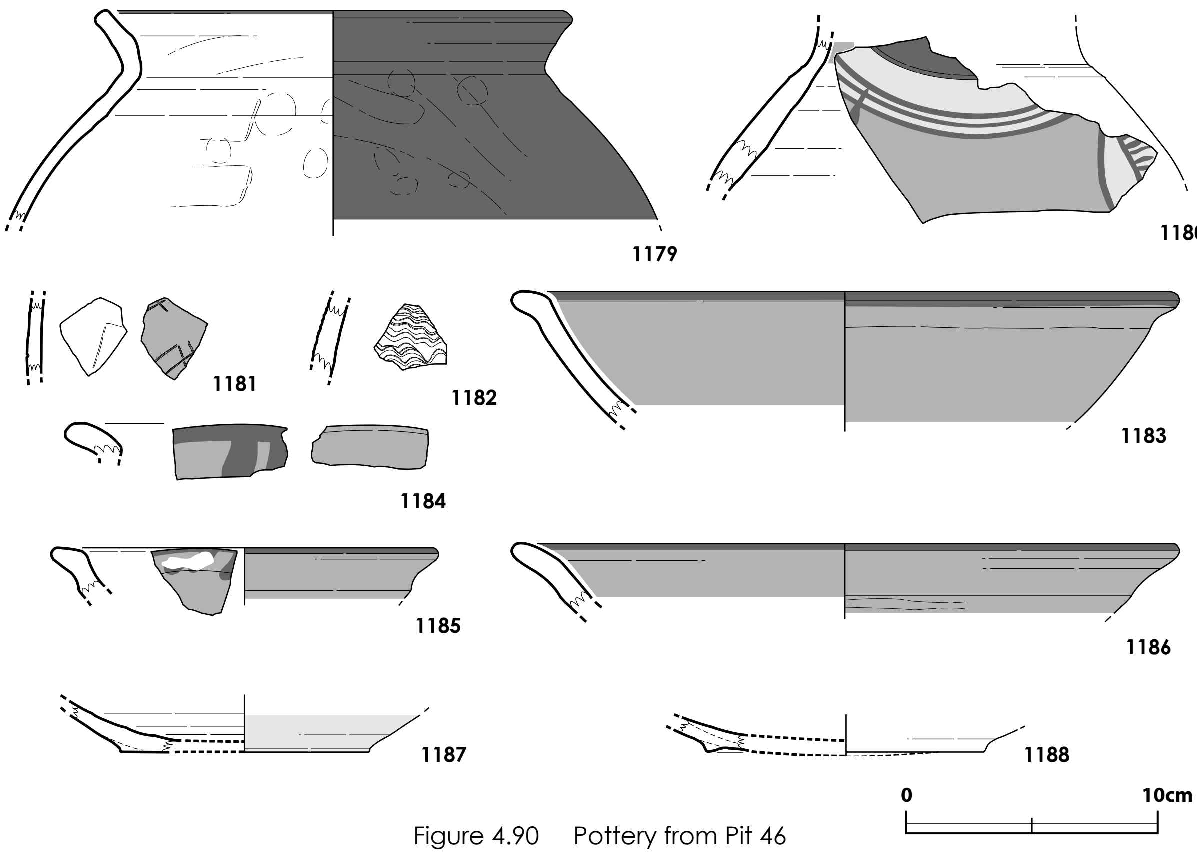


Figure 4.90 Pottery from Pit 46

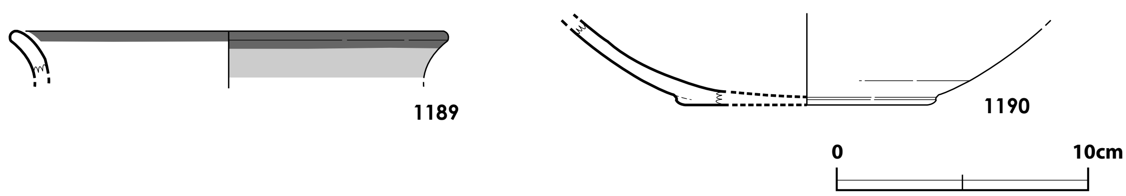


Figure 4.91 Pottery from Pit 49

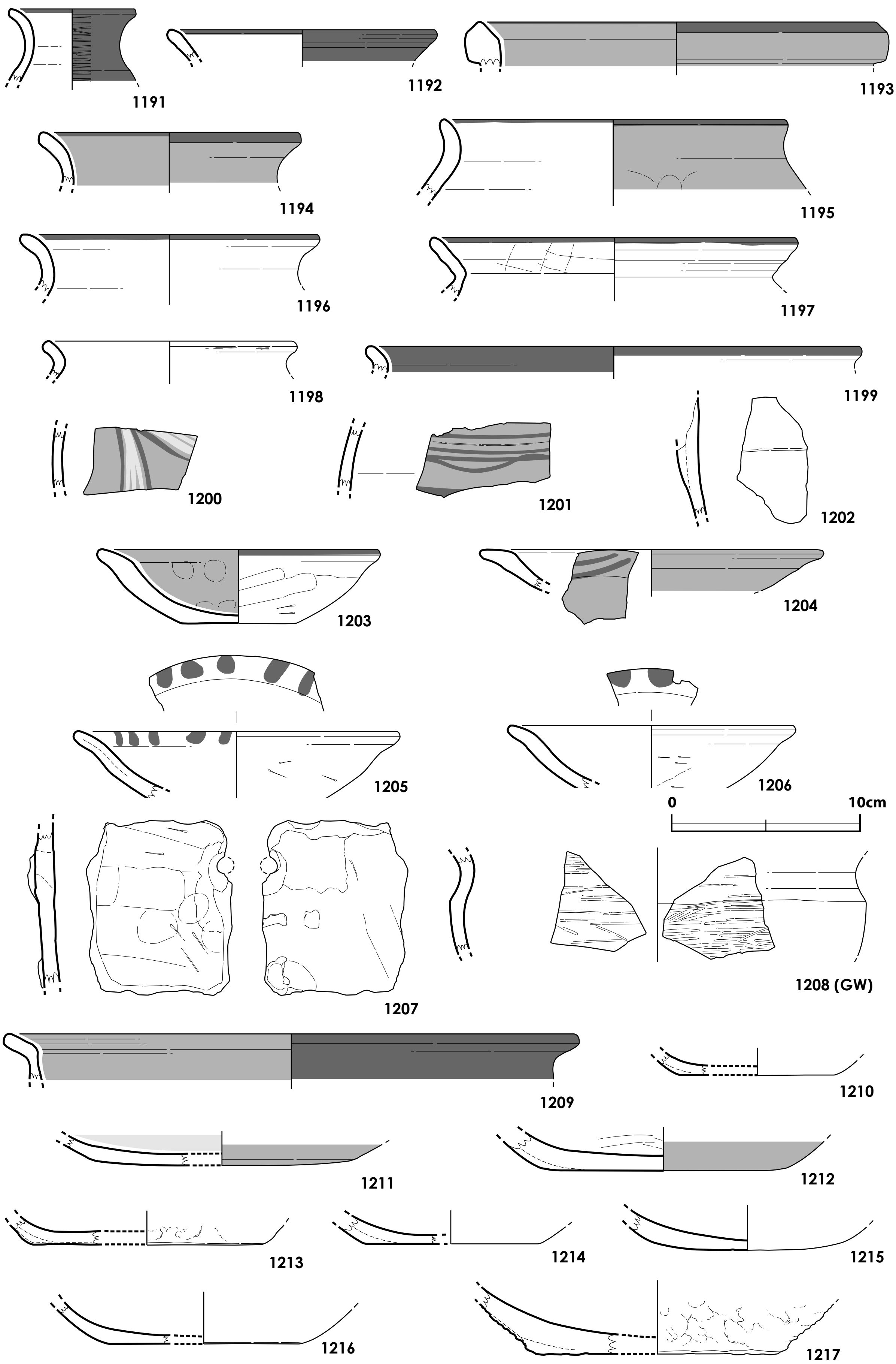


Figure 4.92 Pottery from Pit 50

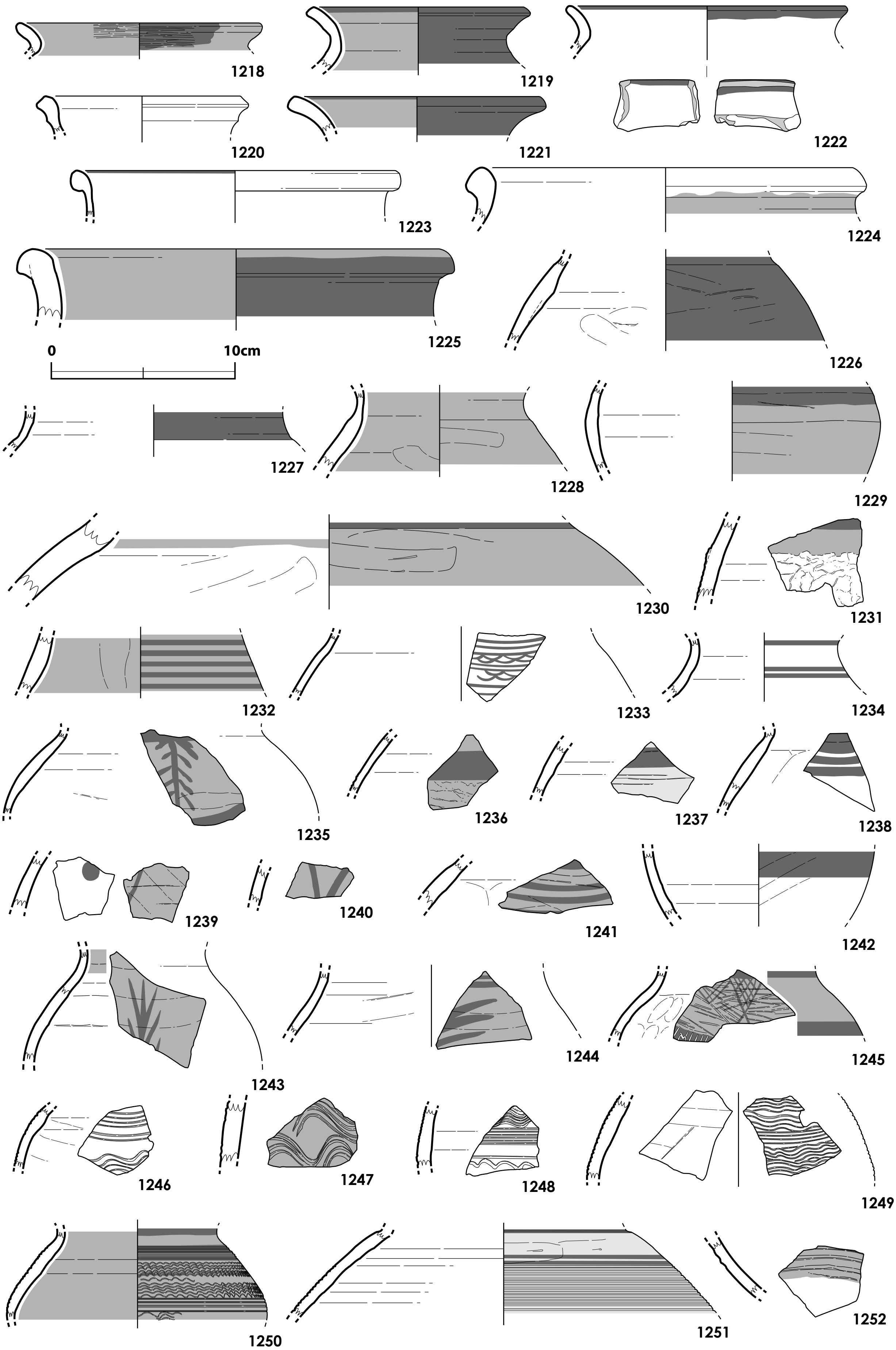


Figure 4.93 Pottery from Pit 100

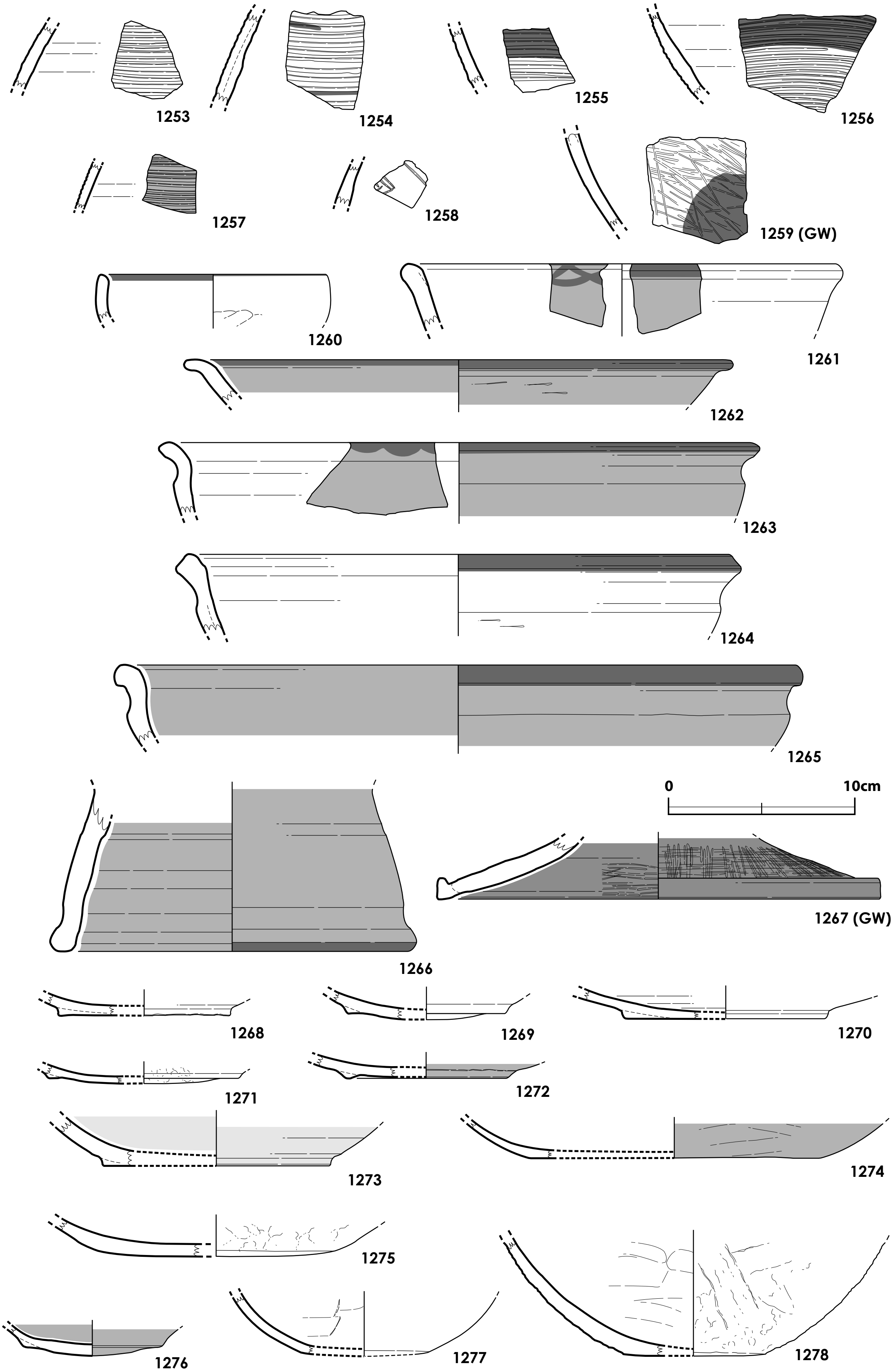


Figure 4.94 Pottery from Pit 100

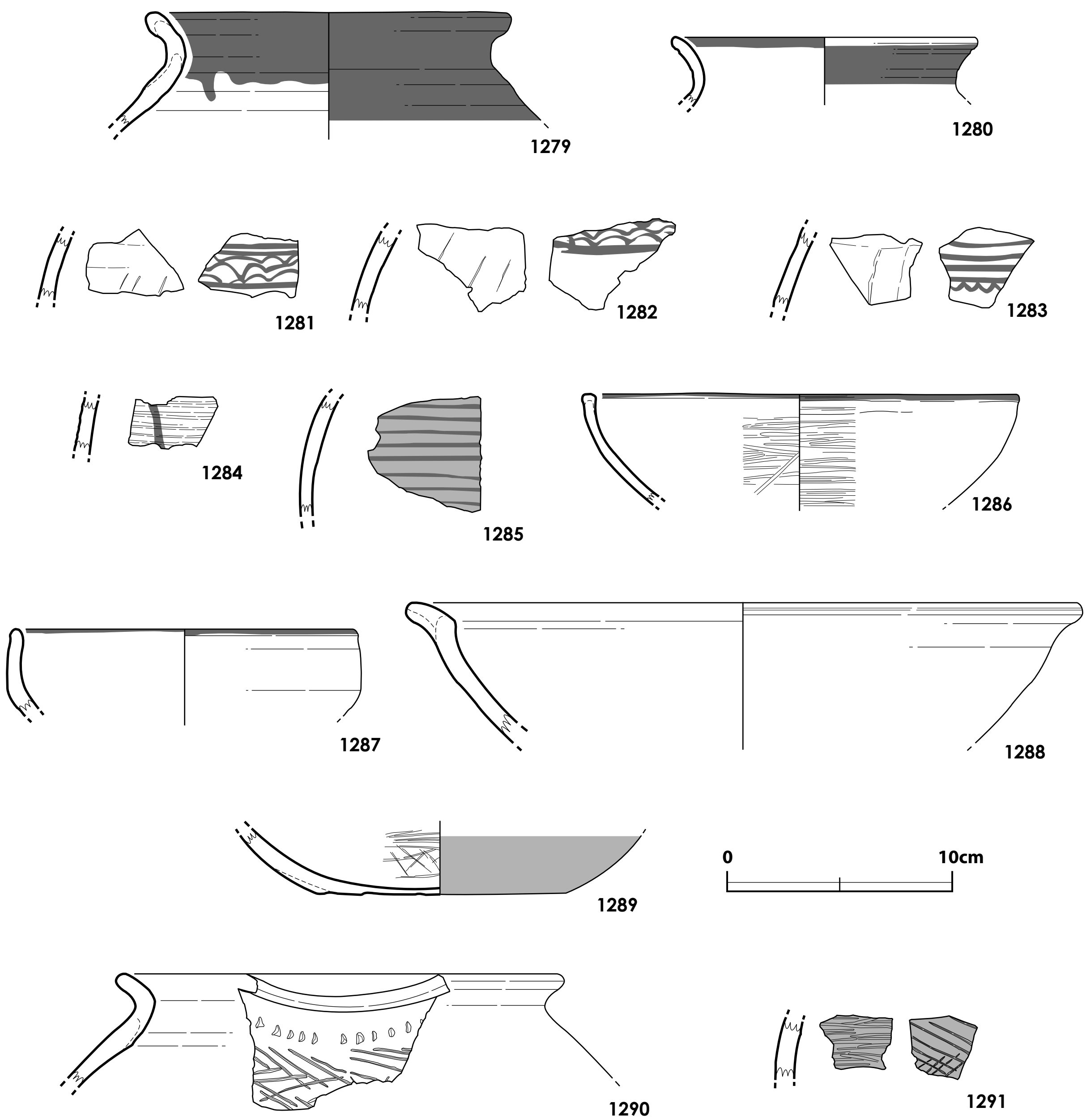


Figure 4.95   Pottery from Trench 13

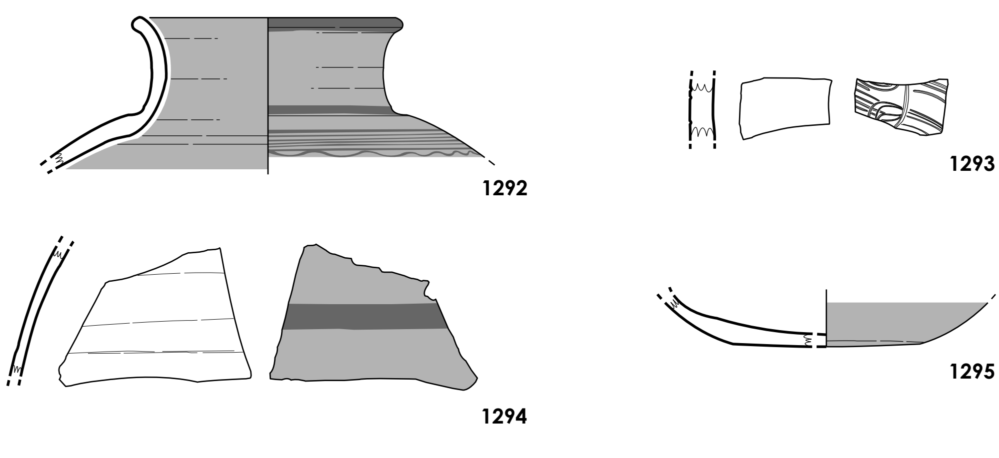


Figure 4.96   Pottery from Trench 19

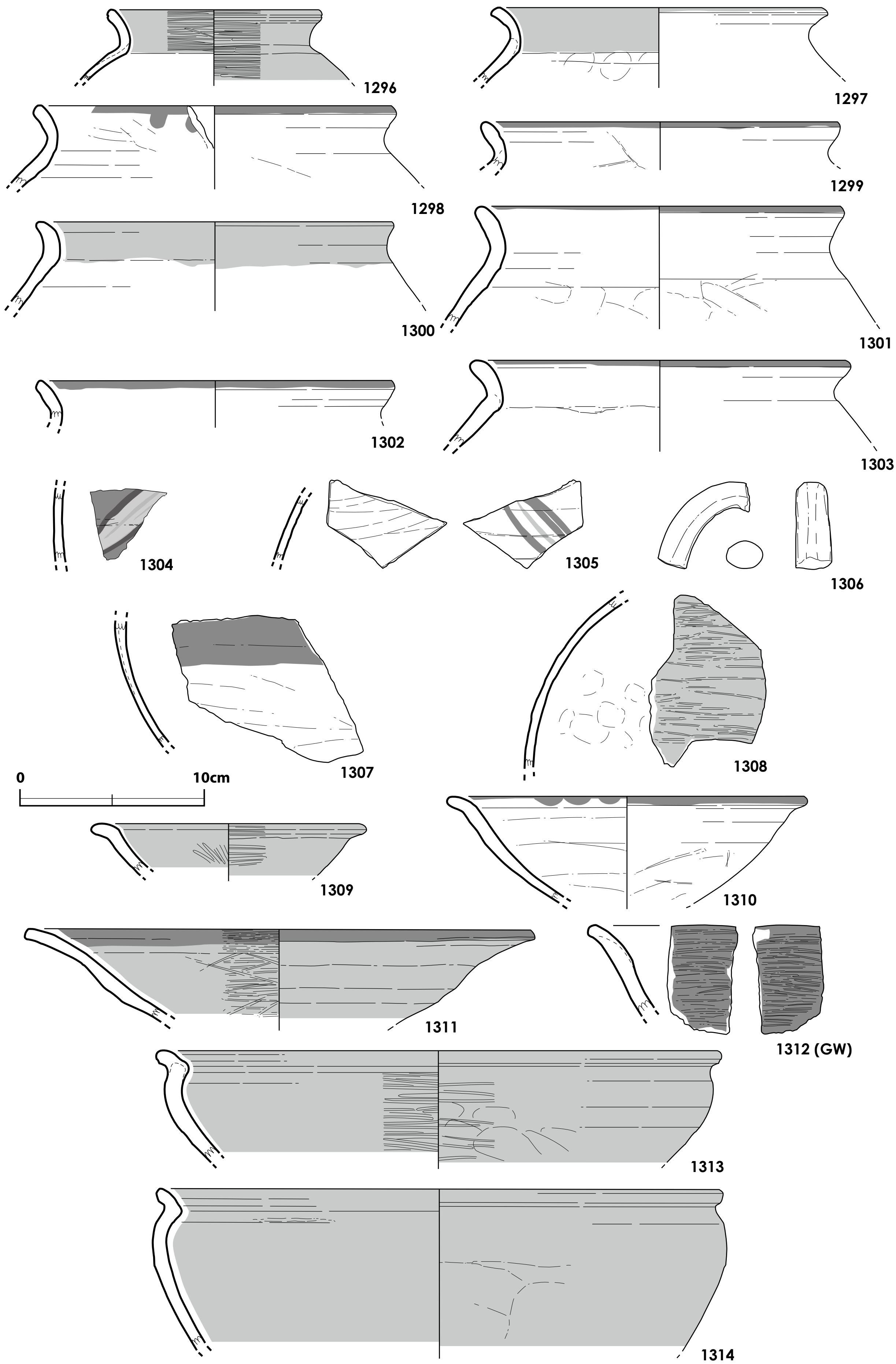


Figure 4.97 Pottery from Trench 19

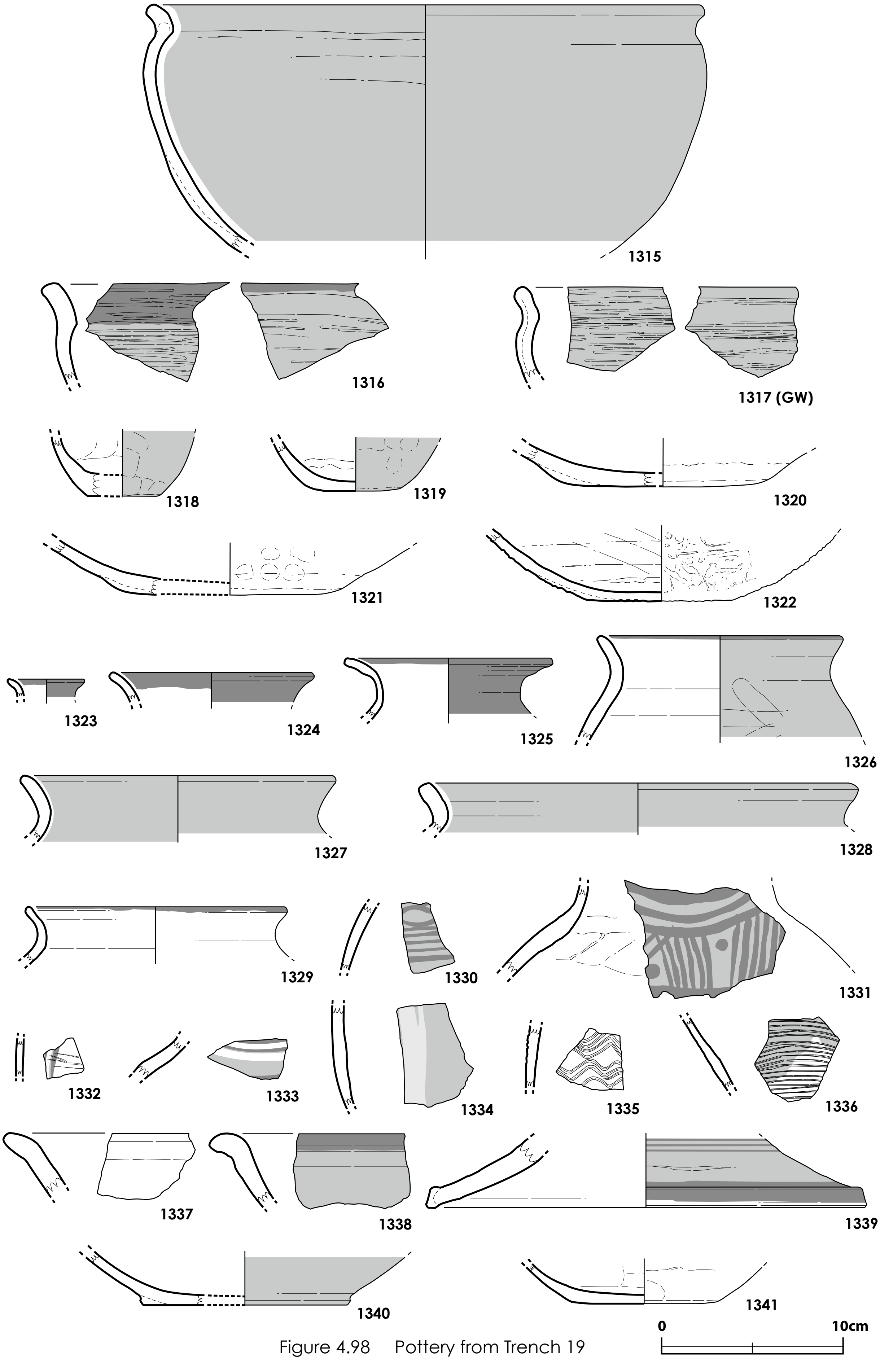


Figure 4.98 Pottery from Trench 19

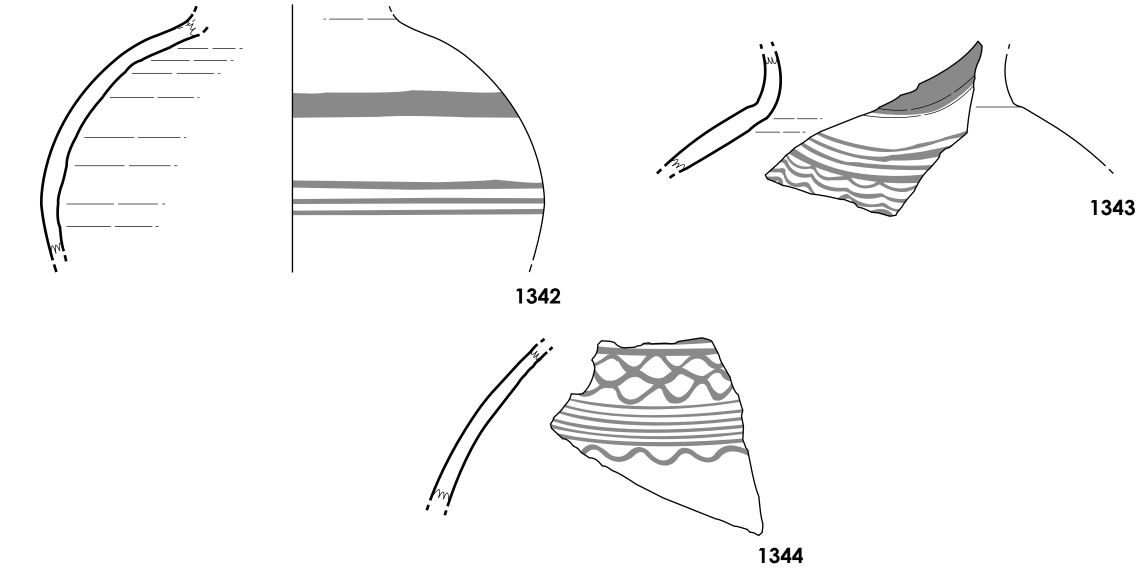


Figure 4.99 Pottery from Trench 31

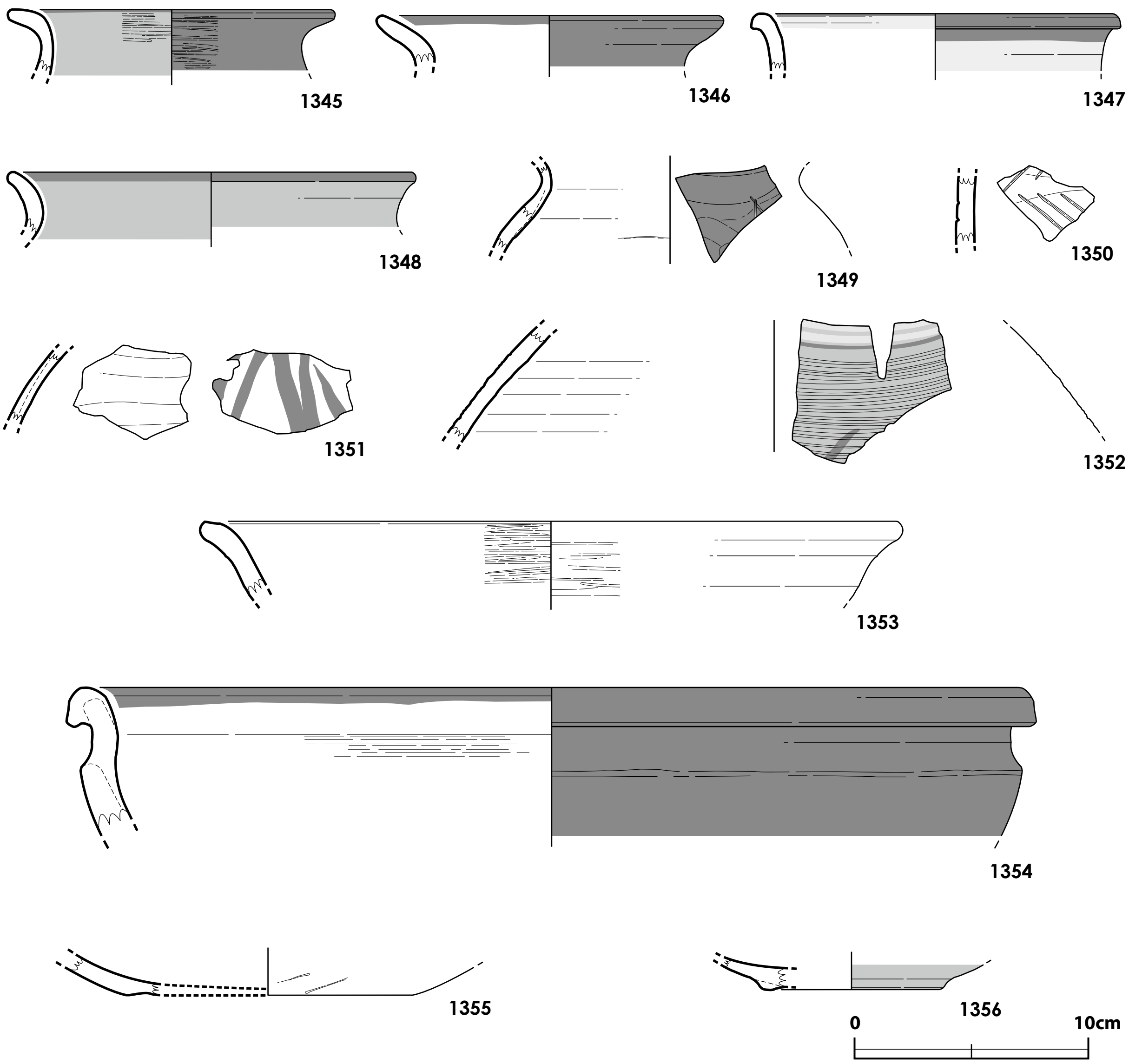


Figure 4.100 Pottery from Trench 37



Figure 4.101 Pottery from Pit 8A (ca. 1/2)



Figure 4.102 Pottery from Pit 10 (ca. 1/2)



Figure 4.103 Pottery from Pit 10 (ca. 1/2)



Figure 4.104 Pottery from Pit 10 (ca. 1/2)



Figure 4.105 Pottery from Pit 11 (ca. 1/2)



Figure 4.106 Pottery from Pit 11 (ca. 1/2)



Figure 4.107 Pottery from Pit 11 (ca. 1/2)

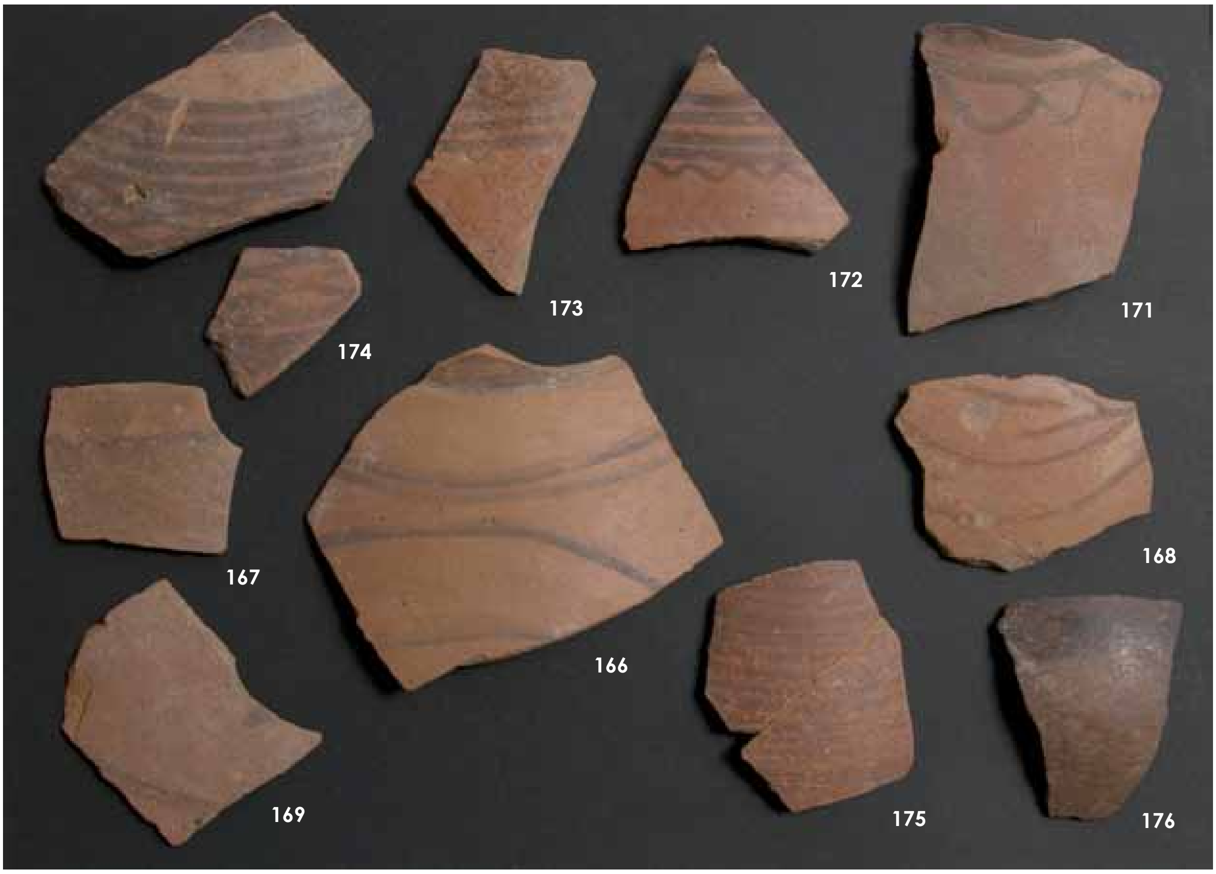


Figure 4.108 Pottery from Pit 11 (ca. 1/2)



Figure 4.109 Pottery from Pit 11 (ca. 1/2)



Figure 4.110 Pottery from Pit 11 (ca. 1/2)



Figure 4.111 Pottery from Pit 11 (ca. 1/2)



Figure 4.112 Pottery from Pit 11 (ca. 1/2)



Figure 4.113 Pottery from Pit 11 (ca. 1/2)



Figure 4.114 Pottery from Pit 11 (ca. 1/2)



Figure 4.115 Pottery from Pit 11 (ca. 1/2)



Figure 4.116 Pottery from Pit 11 (ca. 1/2)



Figure 4.117 Pottery from Pit 13 (ca. 1/2)



Figure 4.118 Pottery from Pit 13 (ca. 1/1)



Figure 4.119 Pottery from Pit 13 (ca. 1/2)



Figure 4.120 Pottery from Pit 13 (ca. 1/2)



Figure 4.121 Pottery from Pit 13 (ca. 1/2)



Figure 4.122 Pottery from Pit 13 (ca. 1/2)



Figure 4.123 Pottery from Pit 14 (ca. 1/2)



Figure 4.124 Pottery from Pit 14 (ca. 1/2)



Figure 4.125 Pottery from Pit 14 (ca. 1/2)



Figure 4.126 Pottery from Pit 14 (ca. 1/2)



Figure 4.127 Pottery from Pit 14 (ca. 1/2)



Figure 4.128 Pottery from Pit 14 (ca. 1/2)



Figure 4.129 Pottery from Pit 14 (ca. 1/2)



Figure 4.130 Pottery from Pit 14 (ca. 1/2)



Figure 4.131 Pottery from Pit 14 (ca. 1/2)



Figure 4.132 Pottery from Pit 14 (ca. 1/2)

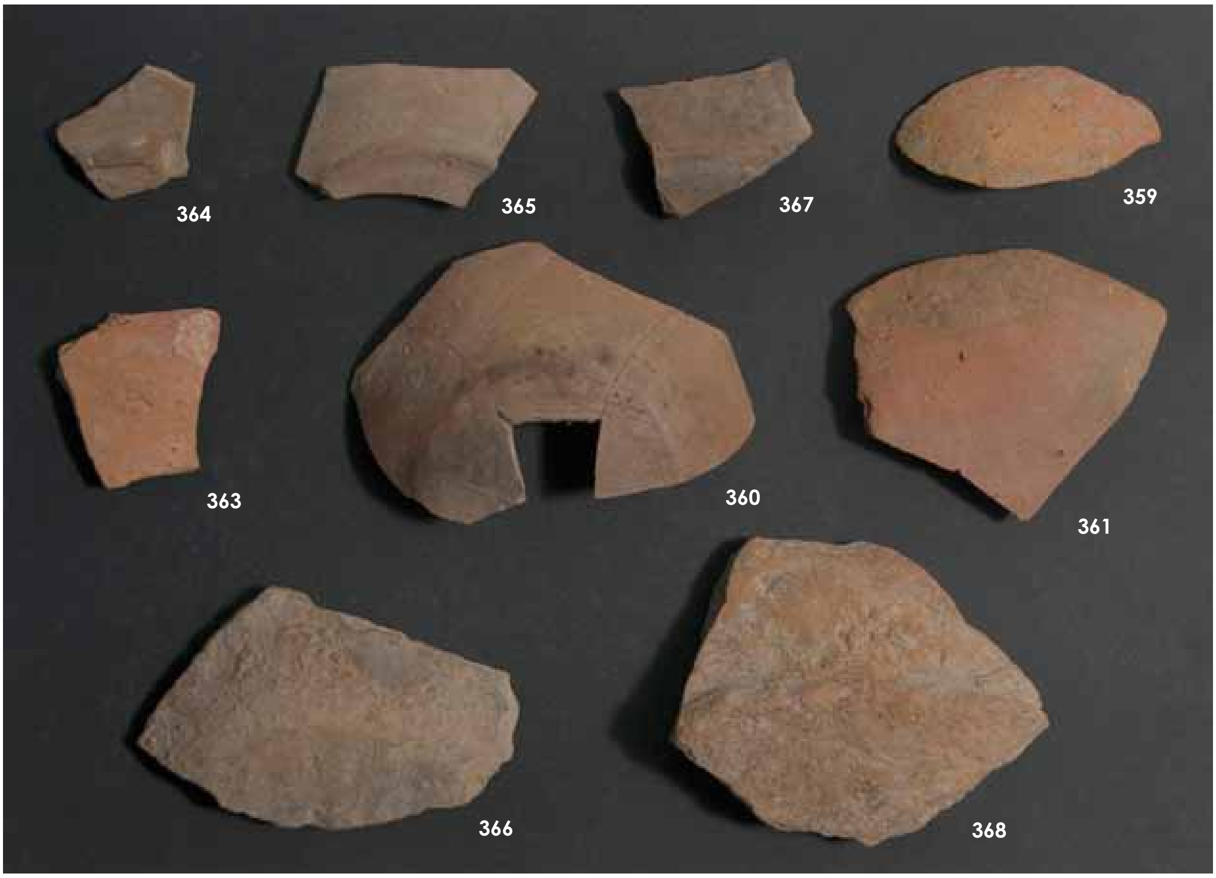


Figure 4.133 Pottery from Pit 14 (ca. 1/2)



Figure 4.134 Pottery from Pit 14 (ca. 1/2)



Figure 4.135 Pottery from Pit 14 (ca. 1/2)



Figure 4.136 Pottery from Pit 14 (ca. 1/2)



Figure 4.137 Pottery from Pit 16 (ca. 1/2)



Figure 4.138 Pottery from Pit 16 (ca. 1/2)



Figure 4.139 Pottery from Pit 18 (ca. 1/2)



Figure 4.140 Pottery from Pit 18 (ca. 1/2)



Figure 4.141 Pottery from Pit 18 (ca. 1/2)



Figure 4.142 Pottery from Pit 18 (ca. 1/2)



Figure 4.143 Pottery from Pit 18 (ca. 1/2)



Figure 4.144 Pottery from Pit 18 (ca. 1/2)



Figure 4.145 Pottery from Pit 18 (ca. 1/2)

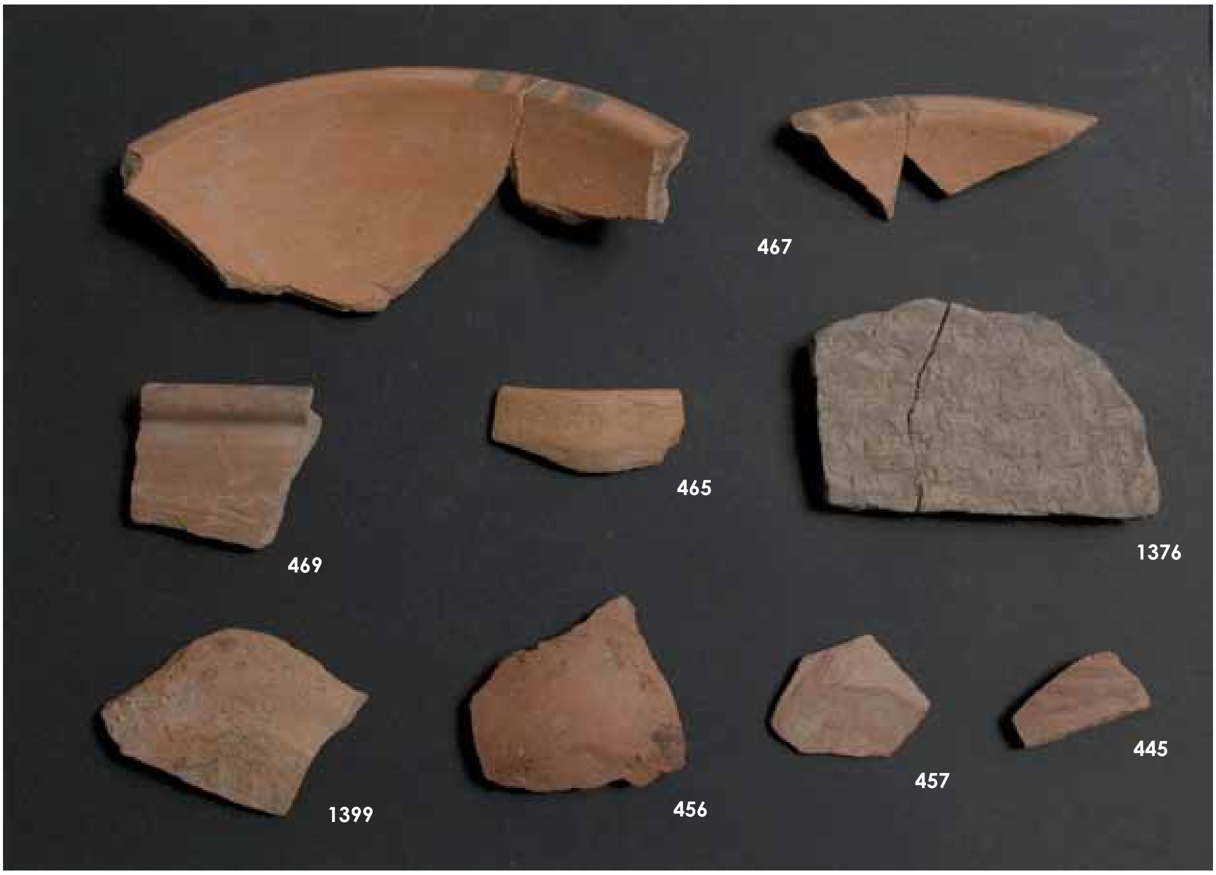


Figure 4.146 Pottery from Pit 18 (ca. 1/2)



Figure 4.147 Pottery from Pit 18 (ca. 1/2)



Figure 4.148 Pottery from Pit 18 (no scale)



Figure 4.149 Pottery from Pit 20 (ca. 1/2)



Figure 4.150 Pottery from Pit 20 (ca. 1/2)



Figure 4.151 Pottery from Pit 20 (ca. 1/2)



Figure 4.152 Pottery from Pit 20 (ca. 1/2)



Figure 4.153 Pottery from Pit 20 (ca. 1/2)



Figure 4.154 Pottery from Pit 20 (ca. 1/2)



Figure 4.155 Pottery from Pit 20 (ca. 1/2)



Figure 4.156 Pottery from Pit 20 (ca. 1/2)



Figure 4.157 Pottery from Pit 26 (ca. 1/2)



Figure 4.158 Pottery from Pit 26 (ca. 1/2)



Figure 4.159 Pottery from Pit 26 (ca. 1/2)



Figure 4.160 Pottery from Pit 26 (ca. 1/2)



Figure 4.161 Pottery from Pit 26 (ca. 1/2)



Figure 4.162 Pottery from Pit 26 (ca. 1/2)



Figure 4.163 Pottery from Pit 34 (ca. 1/2)



Figure 4.164 Pottery from Pit 34 (ca. 1/2)



Figure 4.165 Pottery from Pit 34 (ca. 1/2)



Figure 4.166 Pottery from Pit 34 (ca. 1/2)



Figure 4.167 Pottery from Pit 34 (ca. 1/2)



Figure 4.168 Pottery from Pit 34 (ca. 1/2)



Figure 4.169 Pottery from Pit 34 (ca. 1/2)



Figure 4.170 Pottery from Pit 35 (ca. 1/2)



Figure 4.171 Pottery from Pit 35 (ca. 1/2)



Figure 4.172 Pottery from Pit 35 (ca. 1/2)



Figure 4.173 Pottery from Pit 35 (ca. 1/2)



Figure 4.174 Pottery from Pit 35 (ca. 1/2)



Figure 4.175 Pottery from Pit 35 (ca. 1/2)



Figure 4.176 Pottery from Pit 35 (ca. 1/2)



Figure 4.177 Pottery from Pit 36 (ca. 1/2)



Figure 4.178 Pottery from Pit 36 (ca. 1/2)



Figure 4.179 Pottery from Pit 36 (ca. 1/2)



Figure 4.180 Pottery from Pit 36 (ca. 1/2)



Figure 4.181 Pottery from Pit 36 (ca. 1/2)



Figure 4.182 Pottery from Pit 36 (ca. 1/2)

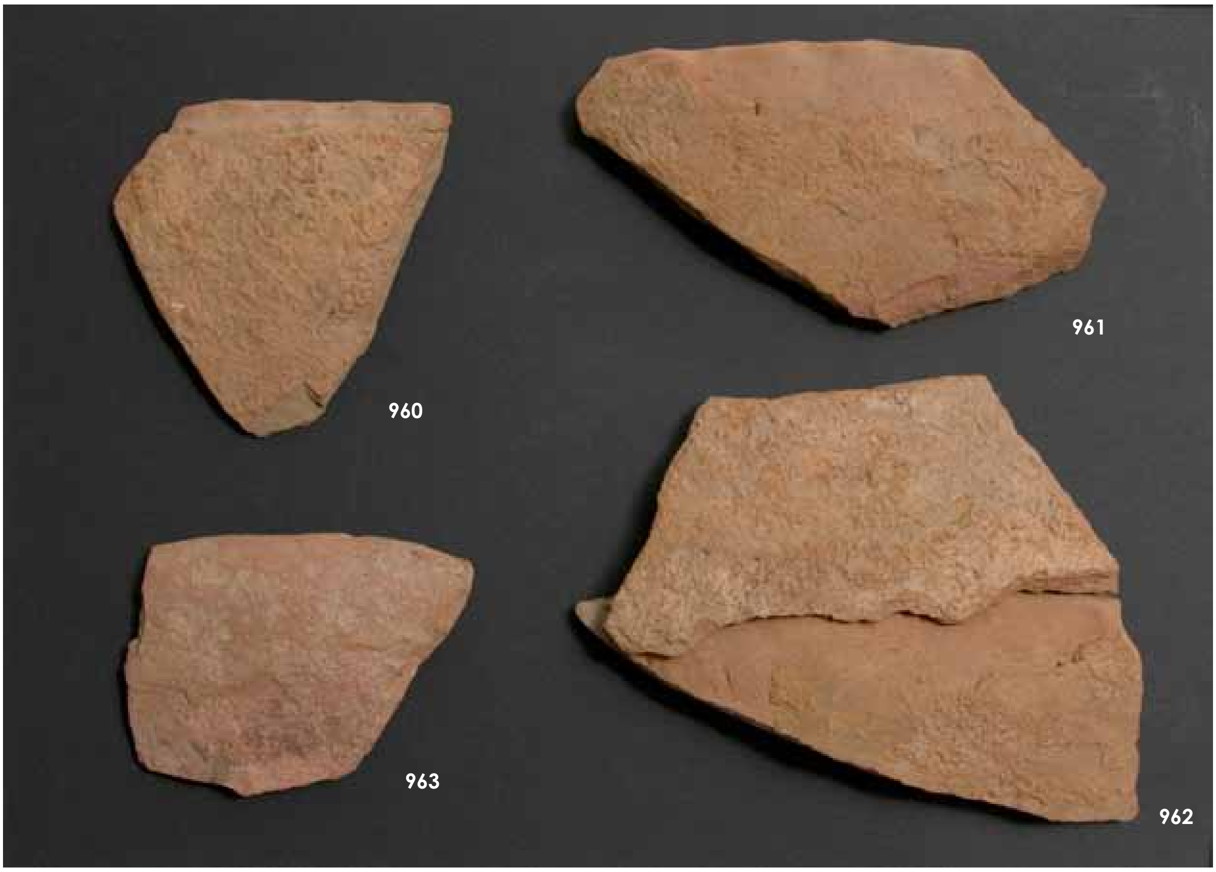


Figure 4.183 Pottery from Pit 36 (ca. 1/2)



Figure 4.184 Pottery from Pit 36 (ca. 1/1)



Figure 4.185 Pottery from Pit 36 (ca. 1/2)



Figure 4.186 Pottery from Pit 36 (ca. 1/2)



Figure 4.187 Pottery from Pit 36 (ca. 1/2)



Figure 4.188 Pottery from Pit 36 (ca. 1/2)



Figure 4.189 Pottery from Pit 36 (ca. 1/2)



Figure 4.190 Pottery from Pit 36 (ca. 1/2)



Figure 4.191 Pottery from Pit 36 (ca. 1/2)



Figure 4.192 Pottery from Pit 36 (ca. 1/2)



Figure 4.193 Pottery from Pit 36 (ca. 1/2)



Figure 4.194 Pottery from Pit 36 (ca. 1/2)



Figure 4.195 Pottery from Pit 36 (ca. 1/2)



Figure 4.196 Pottery from Pit 36 (ca. 1/2)



Figure 4.197 Pottery from Pit 36 (ca. 1/2)



Figure 4.198 Pottery from Pit 36 (ca. 1/2)



Figure 4.199 Pottery from Pit 36 (ca. 1/2)



Figure 4.200 Pottery from Pit 36 (ca. 1/2)



Figure 4.201 Pottery from Pit 36 (ca. 1/2)



Figure 4.202 Pottery from Pit 36 (ca. 1/2)



Figure 4.203 Pottery from Pit 36 (ca. 1/2)



Figure 4.204 Pottery from Pit 36 (ca. 1/2)



Figure 4.205 Pottery from Pit 36 (ca. 1/2)



Figure 4.206 Pottery from Pit 36 (ca. 1/2)



Figure 4.207 Pottery from Pit 36 (ca. 1/2)



Figure 4.208 Pottery from Pit 36 (ca. 1/2)



Figure 4.209 Pottery from Pit 36 (ca. 1/2)

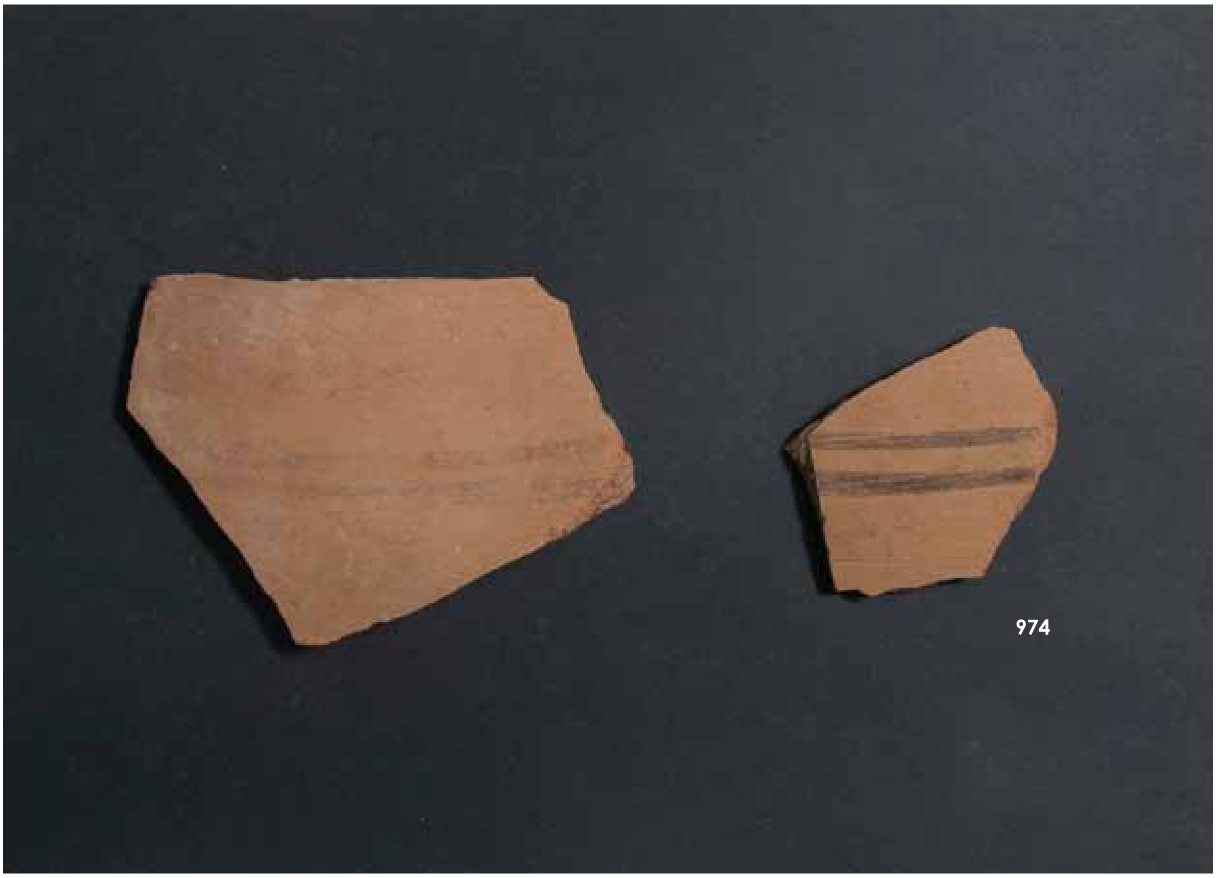


Figure 4.210 Pottery from Pit 36 (ca. 1/2)



Figure 4.211 Pottery from Pit 36 (ca. 1/2)



Figure 4.212 Pottery from Pit 36 (ca. 1/2)



Figure 4.213 Pottery from Pit 36 (ca. 1/2)



Figure 4.214 Pottery from Pit 36 (ca. 1/2)



Figure 4.215 Pottery from Pit 36 (ca. 1/2)



Figure 4.216 Burnt clay lumps from Pit 36 (ca. 1/2)



Figure 4.217 Pottery from Pit 38A (ca. 1/2)



Figure 4.218 Pottery from Pit 38A (ca. 1/2)



Figure 4.219 Pottery from Pit 38A (ca. 1/2)



Figure 4.220 Pottery from Pit 38A (ca. 1/2)



Figure 4.221 Pottery from Pit 38A (ca. 1/2)



Figure 4.222 Pottery from Pit 38A (ca. 1/2)



Figure 4.223 Pottery from Pit 38A (ca. 1/2)



Figure 4.224 Pottery from Pit 38A (ca. 1/2)



Figure 4.225 Pottery from Pit 44 (ca. 1/2)



Figure 4.226 Pottery from Pit 44 (ca. 1/2)



Figure 4.227 Pottery from Pit 44 (ca. 1/2)



Figure 4.228 Pottery from Pit 44 (ca. 1/2)



Figure 4.229 Pottery from Pit 100 (ca. 1/2)



Figure 4.230 Pottery from Pit 100 (ca. 1/2)



Figure 4.231 Pottery from Pit 100 (ca. 1/2)



Figure 4.232 Pottery from Pit 100 (ca. 1/2)



Figure 4.233 Pottery from Pit 100 (ca. 1/2)



Figure 4.234 Pottery from Pit 100 (ca. 1/2)



Figure 4.235 Pottery from Pit 100 (ca. 1/2)



Figure 4.236 Pottery from Trench 19 (ca. 1/2)



Figure 4.237 Pottery from Trench 19 (ca. 1/2)



Figure 4.238 Pottery from Trench 19 (ca. 1/2)



Figure 4.239 Pottery from Trench 19 (ca. 1/2)



Figure 4.240 Pottery from Trench 19 (ca. 1/2)



Figure 4.241 Pottery from Trench 19 (ca. 1/2)



Figure 4.242 Pottery from Trench 19 (ca. 1/2)



Figure 4.243 Pottery from Trench 19 (ca. 1/2)



Figure 4.244 Pottery from Trench 31 (ca. 1/2)

CHAPTER 5

MINOR OBJECTS FROM GIRAWAD

BY AKINORI UESUGI

1 OUTLINE

The excavations yielded a limited number of minor artefacts numbering 99. One of the reasons for this may be that the upper part of the occupational levels had been removed by the road construction. And another reason may be derived from the nature of the habitation at the site.

Among the artefacts recovered from the site, terracotta (62 in number), stone (15), faience (2), bone (7), copper (11) and silver (2) artefacts were identified.

2 TERRACOTTA OBJECTS

The terracotta objects consist of bangles (28 in number), beads (4), perforated discs (6), used potsherds (17), balls (4) and indeterminate objects (3).

2.1 Bangles

Twenty-eight bangles were recovered from the excavations (nos. 1 - 14). All are fragments. Nos. 1 - 4 has a round section, nos. 5 - 10 a plano-convex section, nos. 11 - 13 a flat rectangular section. No. 14 has a irregular section. No. 12 with the flat rectangular section has shallow grooves on its external surface. Eight specimens are painted black. One specimen is red slipped (no. 11). No. 14 is painted with parallel black strokes.

Fifteen specimens were found from Pit no. 11 and one each from Pit nos. 8A, 14B, 15, 17, 21, 33A, 48A and 44. Three were collected from the surface.

2.2 Beads

Four beads were found in the excavations (nos. 15 - 18). These beads are all truncated globular in shape. In terms of size, they range from 2.8 cm to 3.3 cm in diameter and 3.0 to 3.4 cm in height. The holes measure 0.85 cm to 1.3 cm in diameter. One specimen was recovered from Pit no. 21 and two from Pit no. 36. On specimen was collected from the eastern section.

2.3 Balls

Four terracotta balls were found in the excavations (nos. 39 - 42). Of them, two specimens are complete (no. 40), which measure 1.3 cm to 1.9 cm. One of the broken pieces (no. 42) has a large size around 5.0 cm in diameter. They were recovered from Pit nos. 7A, 20, 22 and 49 each.

2.4 Perforated discs

Six pieces of terracotta discs were recovered from the excavations. All are broken. Among them five specimens are illustrated (nos. 19 - 23). These discs measure 5.3 cm to 9.7 cm in diameter and 1.9 cm to 2.6 cm in thickness. The holes in their centre are around 0.3 cm to 1.0 cm in diameter. Two were found in Pit

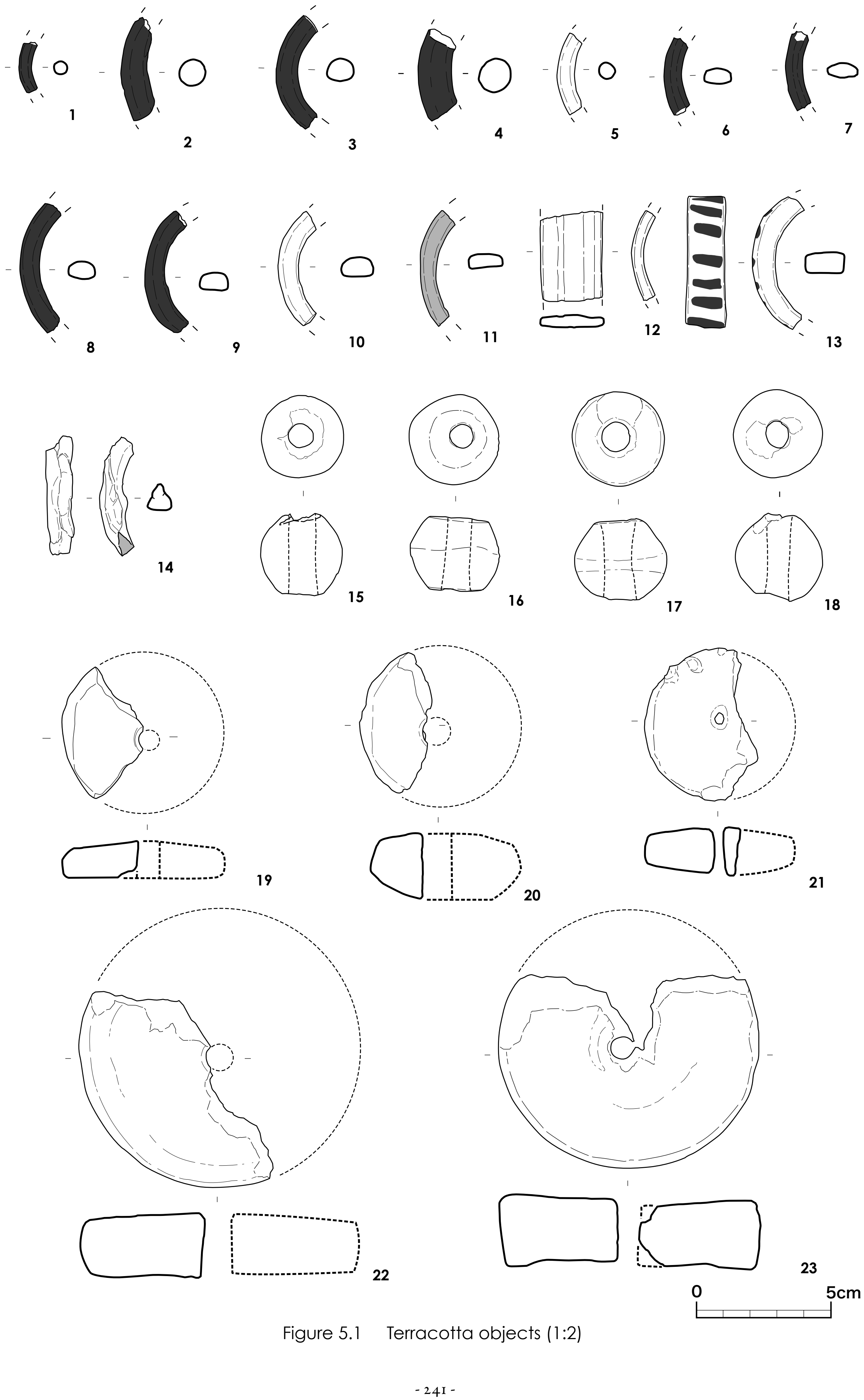


Figure 5.1 Terracotta objects (1:2)

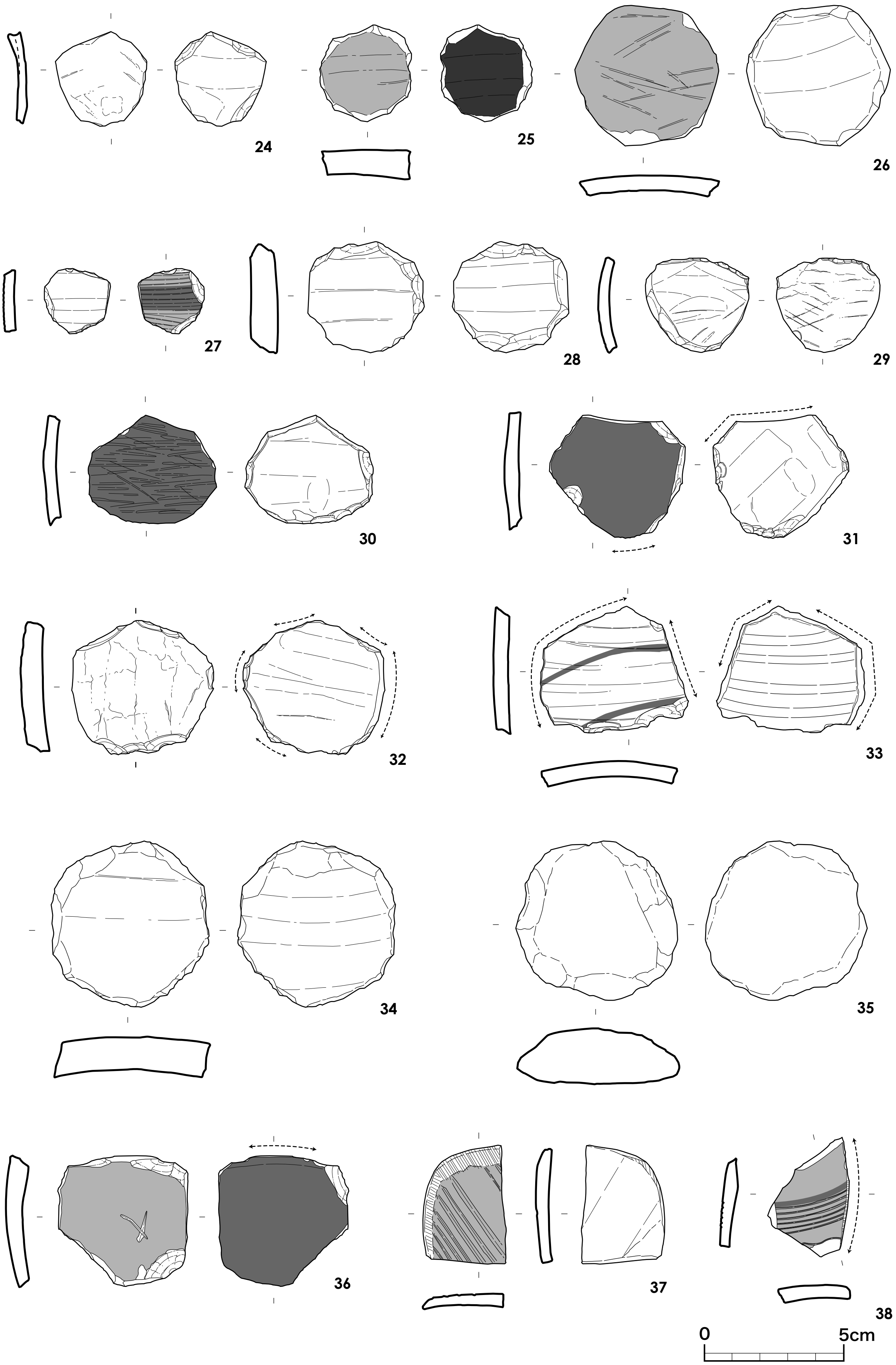


Figure 5.2 Terracotta objects (1:2)

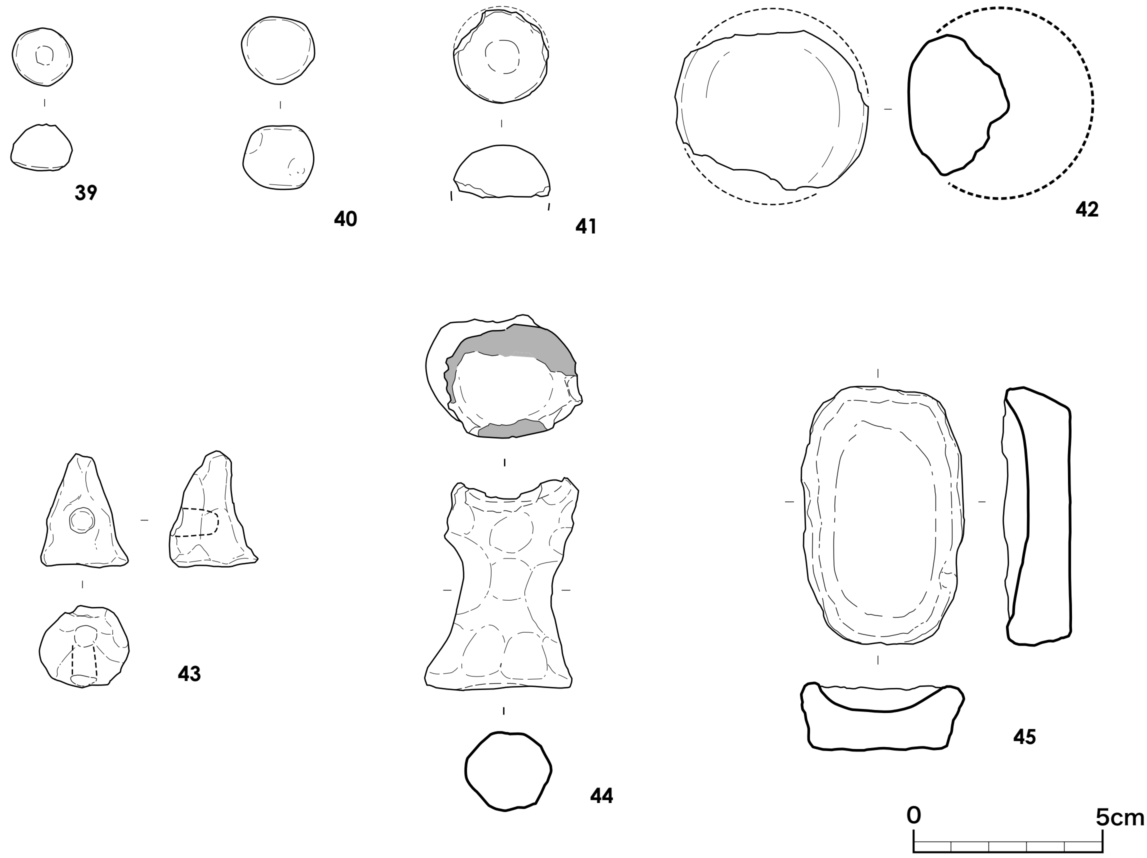


Figure 5.3 Terracotta objects (1:2)

no. 18 and one each in Pit nos. 20, 26 and 35.

2.5 Used potsherds

17 specimens of potsherds that were reused for some kinds of purposes were recovered from the excavations (nos. 24 - 38, 75 - 78). Of them, 10 specimens are circular in shape that was created by retouching around the edge and five have irregular shapes regardless that they were retouched. On six specimens, a use-wear were observed on the edge, which were represented by smooth face of the edge (nos. 31, 32, 33, 36, 37 and 38). These specimens suggest that they were used as a kind of smoother. Taking into consideration that two or three pottery kiln were found at the site, it is likely that these objects were used as a smoother in pottery making process. Of these specimens with a use wear, no. 37 has a prominent use-wear on its edge.

Three each were recovered from Pit nos. 14 and 40, two each from Pit nos. 16 and 35, and one each from Pit nos. 10, 15, 20, 26 and 34.

2.7 Other objects

No. 43 is a conical objects that is crudely modelled. It has a unfinished hole on the body. It measures 2.3 cm in width, 2.1 cm in thickness and 3.1 cm in height. This was recovered from Pit no. 18.

No. 44 has a hour-glass-shape that is crudely modelled. Both ends are concave. It measures 3.3 cm to 3.4 cm in diameter and 5.5 cm in height. This was unearthed from Pit no. 18.

No. 45 has an oblong plan with a hollow on one side. This may be a kind of vessel. It measures 6.8 cm in length, 4.3 cm in width and 1.7 cm in height. This was found in Pit no. 18.

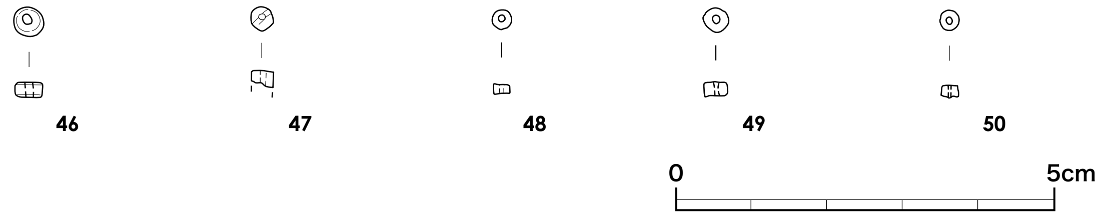


Figure 5.4 Steatite beads (1:1)

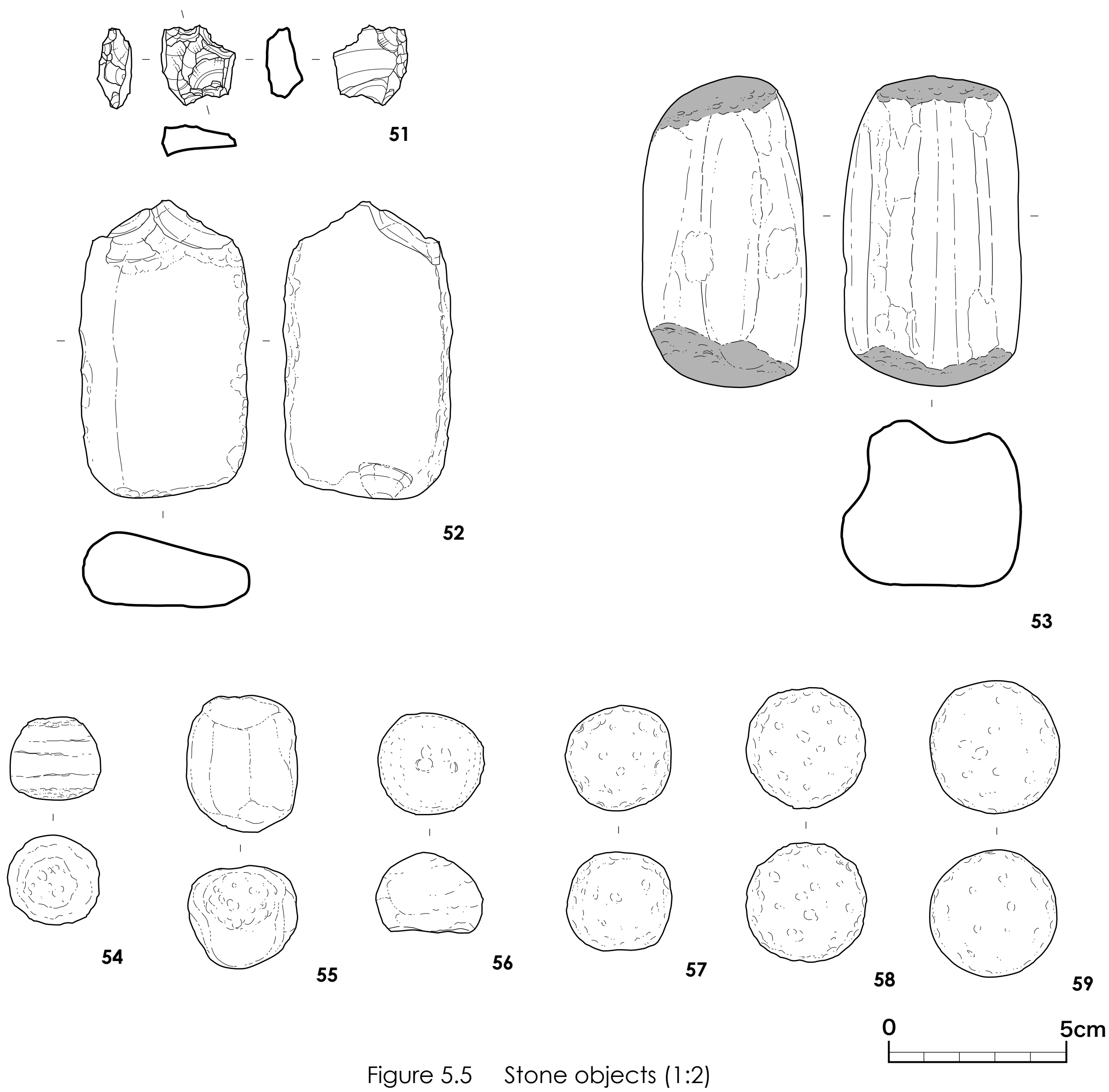


Figure 5.5 Stone objects (1:2)

3 STONE OBJECTS

3.1 Beads

Five tiny steatite beads were recovered (nos. 46 - 50). They are short cylindrical shape measuring 2.5 mm to 3.8 mm in diameter and 1.04 mm to 2.13 mm in height. Of them one was found from Pit no. 39 and the rest were from the surface.

3.2 Poundingstones / hammerstones

Two poundingstones were recovered from Pit no. 11 (nos. 54 - 55). No. 54 has working faces on both ends which exhibit use-wear of hammering. It has two broad grooves on its side. No. 53 has a pecked face on one end indicating that this was used as a hammerstone.

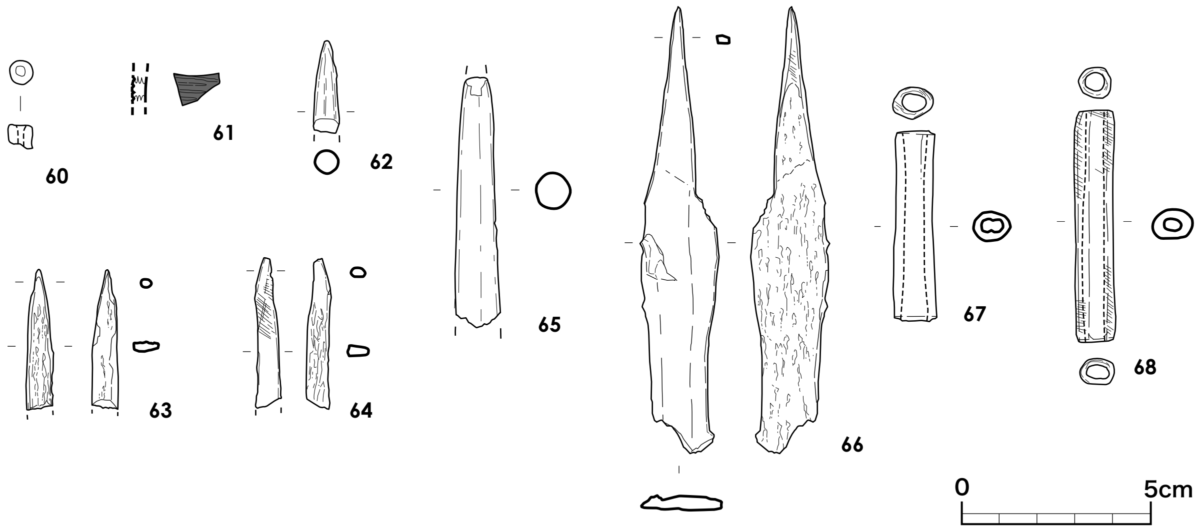


Figure 5.6 Faience and bone objects (1:2)
60 - 61: Faience object, 62 - 66: Bone points, 67 - 68: Bone beads

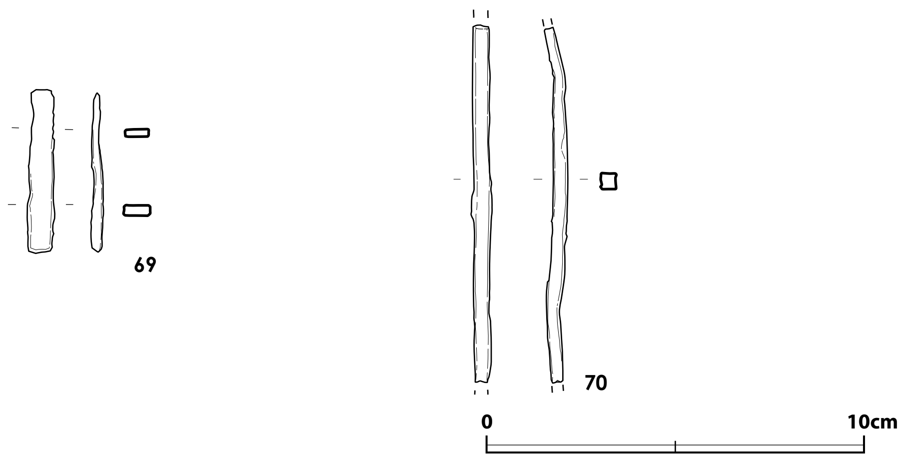


Figure 5.7 Copper objects (1:2)

3.3 Core

One core of yellow chert was collected from the surface (no. 51). It measures 2.3 cm in length, 2.0 cm in width and 9.55 cm in thickness and weighs 4.63 g. No cortex is intact.

3.4 Balls

Six stone balls were recovered from the excavations (nos. 54 - 59). They were modelled by pecking. Five are spherical and one is oblong in shape. The spherical ones measure 2.3 cm to 3.8 cm in diameter and weighs 19.6 g to 57.8 g. The oblong one measures 3.8 cm in length and 2.9 cm in width and weighs 43.8 g. Nos. 55 and 56 may have been used as a kind of hammerstone.

One each was recovered from Pit nos. 18, 37 and 44, and three from the surface.

4 FAIENCE OBJECTS

4.1 Bangles

One fragment of a faience bangle was found on the surface (no. 61). It is decorated with parallel grooves and coated with a blue-green glaze.

4.2 Bead

One bead was collected from Pit no. 14 (no. 60). It measures 3.0 mm in diameter and 4.9 mm in height. It is coated with a bluish graze.

5 BONE OBJECTS

5.1 Bead

Two tubular beads were recovered from the excavations (nos. 67 and 68). These beads measure 5.0 cm and 6.1 cm in length and 1.0 cm in diameter respectively. One each was yielded in Pit nos. 7A and 18.

5.2 Points

Five points were recovered from the excavations nos. 62 - 66). Of them two specimens (nos. 62 and 65) are well modelled having a round section. The other three (nos. 63, 64 and 66) have a flat section. On no. 66 only a pointed end was modelled while the other part was not processed. One each was found in Pit nos. 7, 14, 17 20 and one on the surface.

6 COPPER OBJECTS

6.1 Bead

One copper artefact (no. 85) which appears a bead was found on the surface. This measures 0.9 cm in length and 0.3 cm in diameter.

6.2 Rod

Two rods with a square or flat section were collected on the surface (nos. 69 and 70). It measures 9.4 cm in length and 4.81 cm in width and 3.68 cm in thickness.

6.3 Fragments

Eight fragments of indeterminate nature were recovered (nos. 86 - 92). Four of them are thin sheets. All of them were collected on the surface.

7 SILVER OBJECTS

7.1 Ear-rings

A pair of silver ear-rings were found on the surface (nos. 79 and 80). They are probably from modern times.

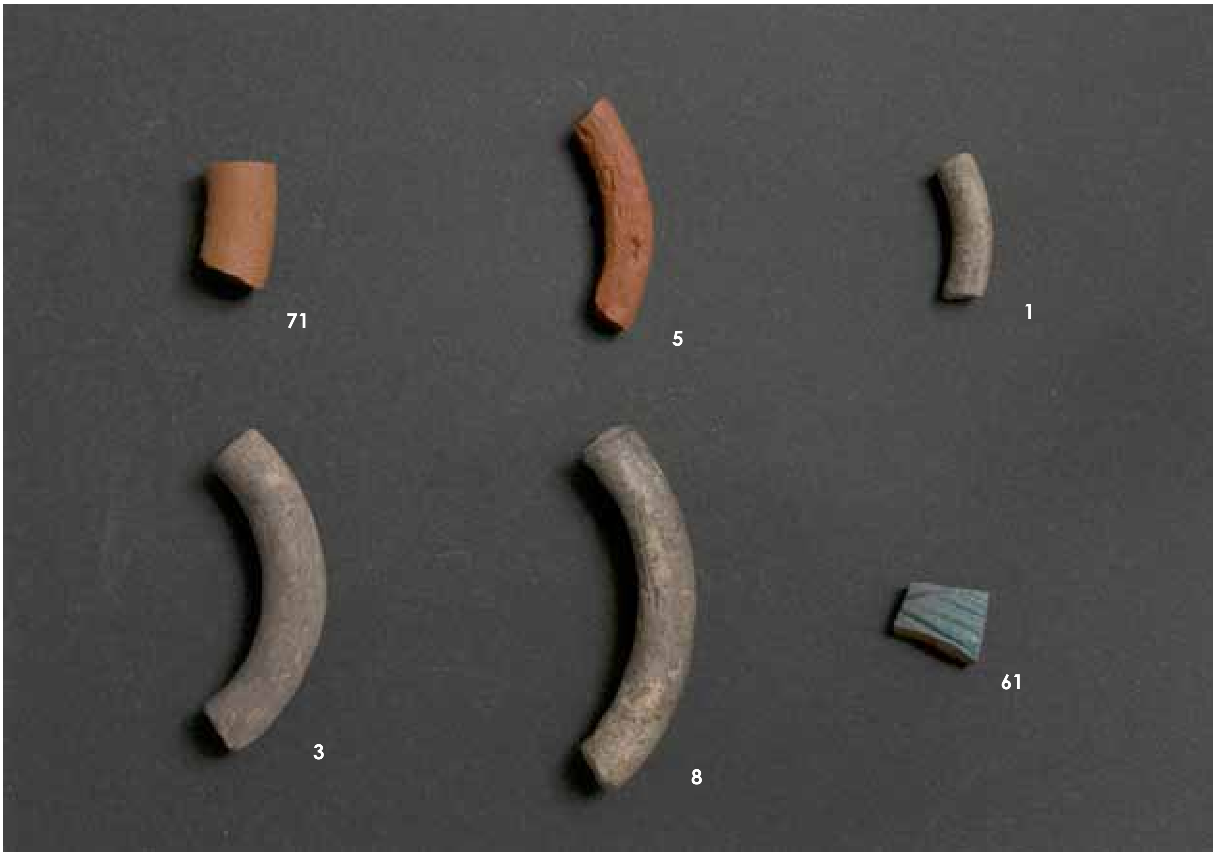


Figure 5.8 Terracotta bangles and faiance object (ca. 1/1)



Figure 5.9 Terracotta bangles (ca. 1/1)

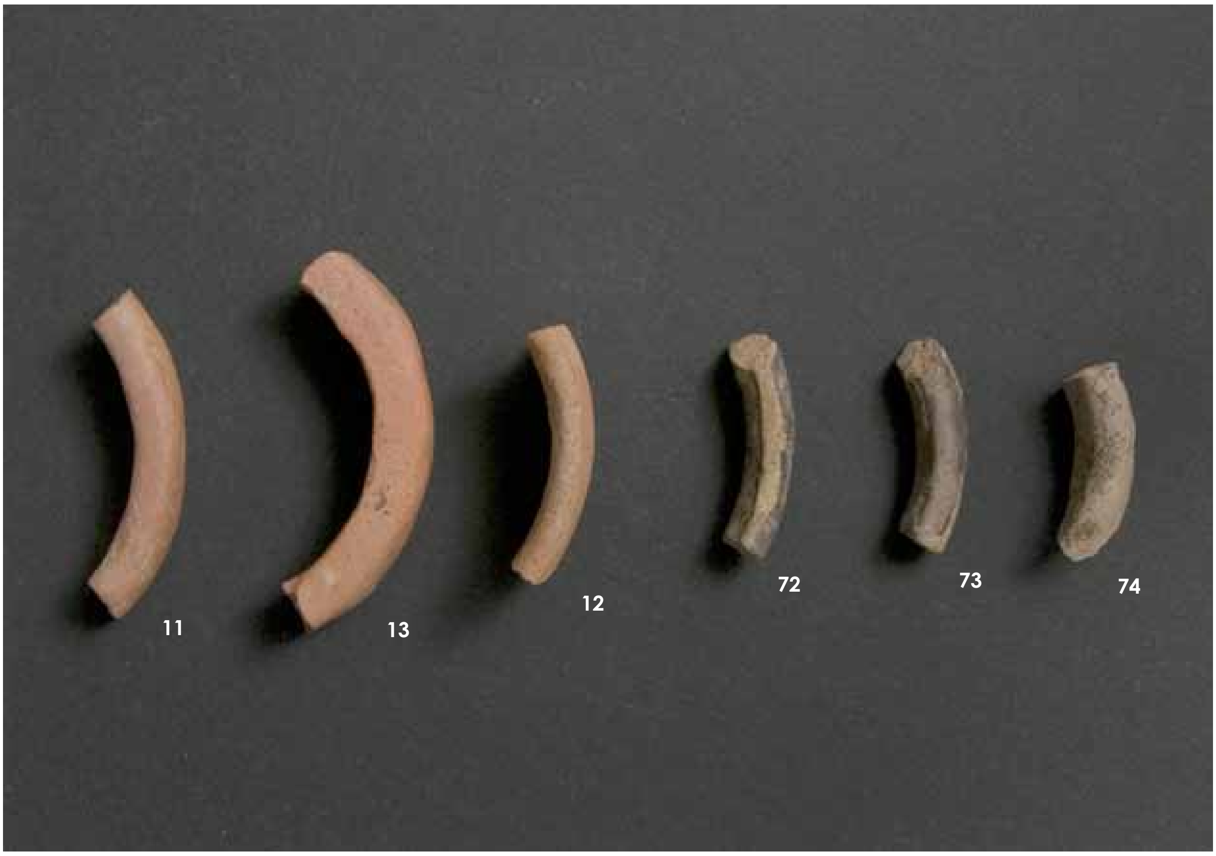


Figure 5.10 Terracotta bangles (ca. 1/1)



Figure 5.11 Terracotta bangles (ca. 1/1)



Figure 5.12 Terracotta beads (ca. 1/1)

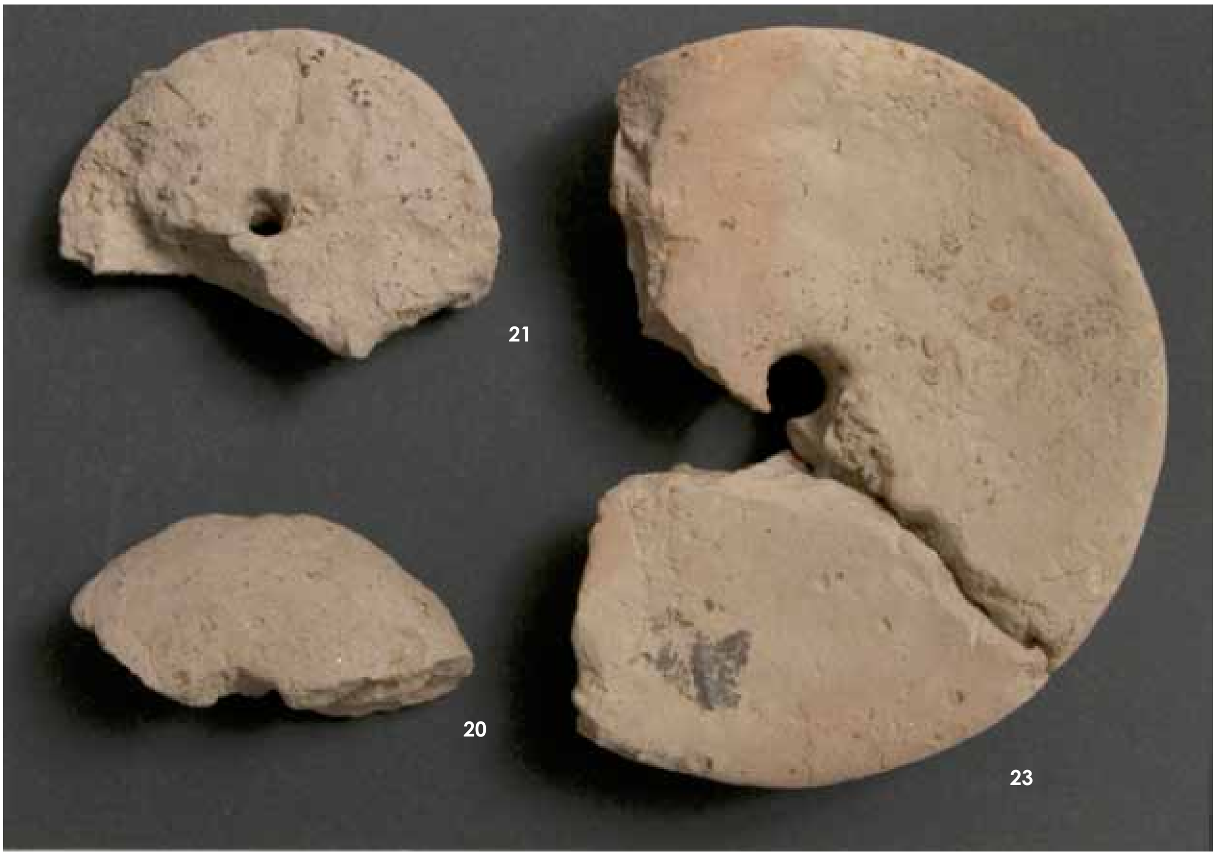


Figure 5. 13 Terracotta perforated discs (ca. 1/1)



Figure 5.14 Terracotta perforated disc (ca. 1/1)

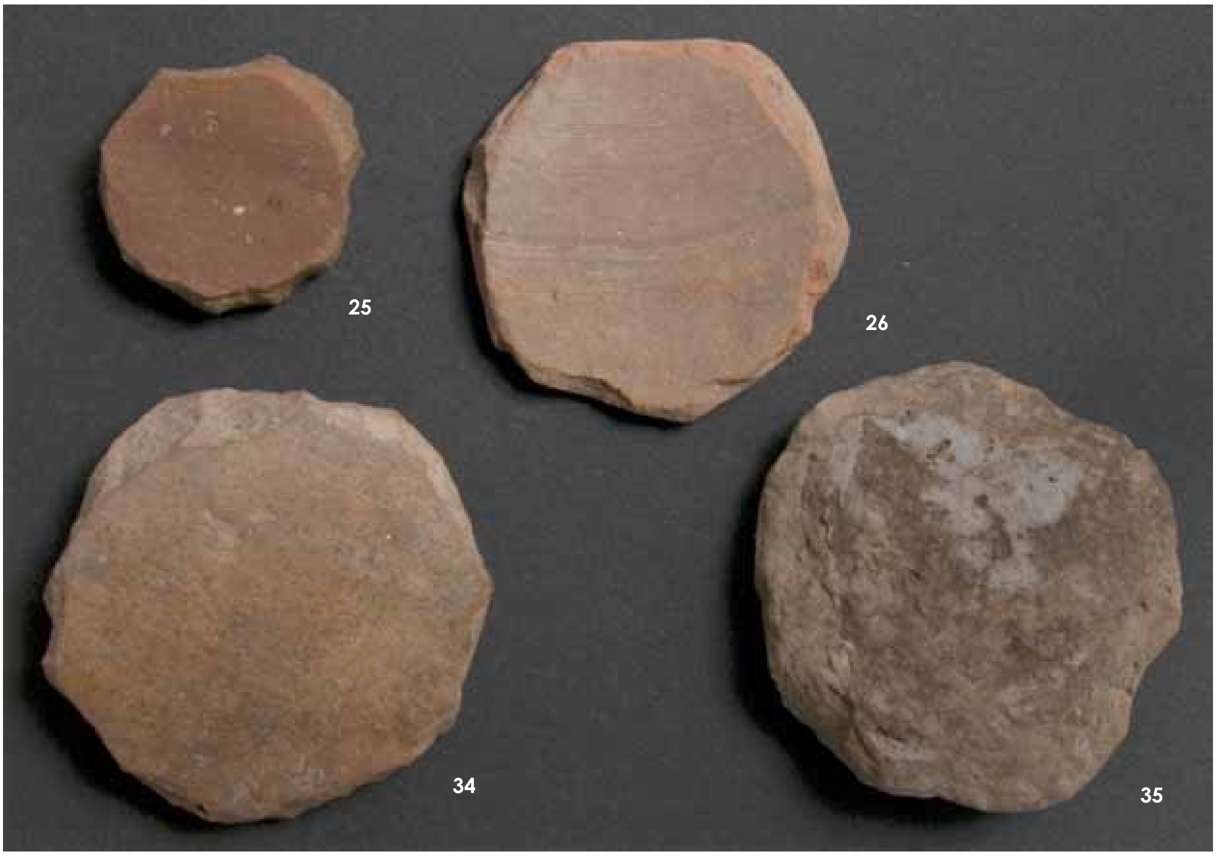


Figure 5.15 Reused potsherds (ca. 1/1)



Figure 5.16 Reused potsherds (ca. 1/1)

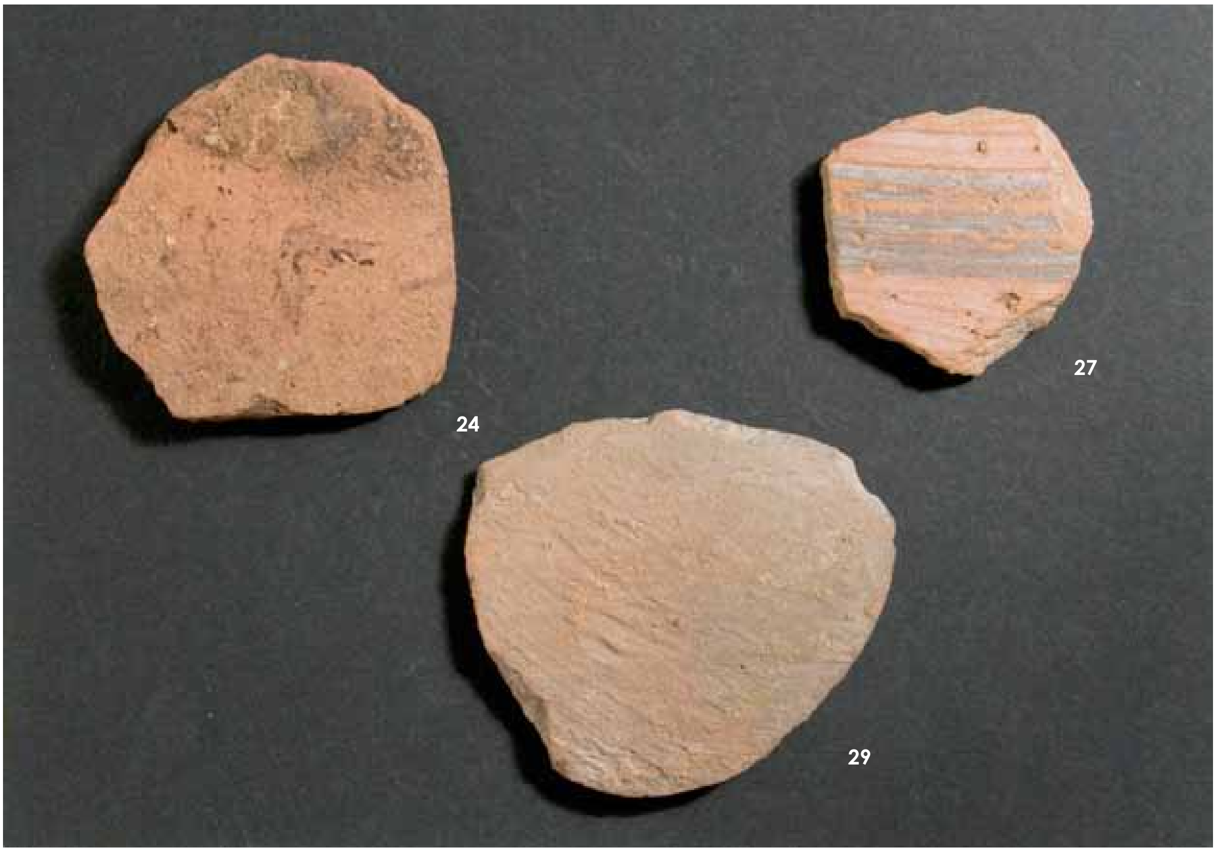


Figure 5.17 Reused potsherds (ca. 1/1)



Figure 5.18 Reused potsherds (ca. 1/1)



Figure 5.19 Reused potsherds (ca. 1/1)



Figure 5.20 Reused potsherds (ca. 1/1)



Figure 5.21 Reused potsherds (ca. 1/1)



Figure 5.22 Reused potsherds (ca. 1/1)

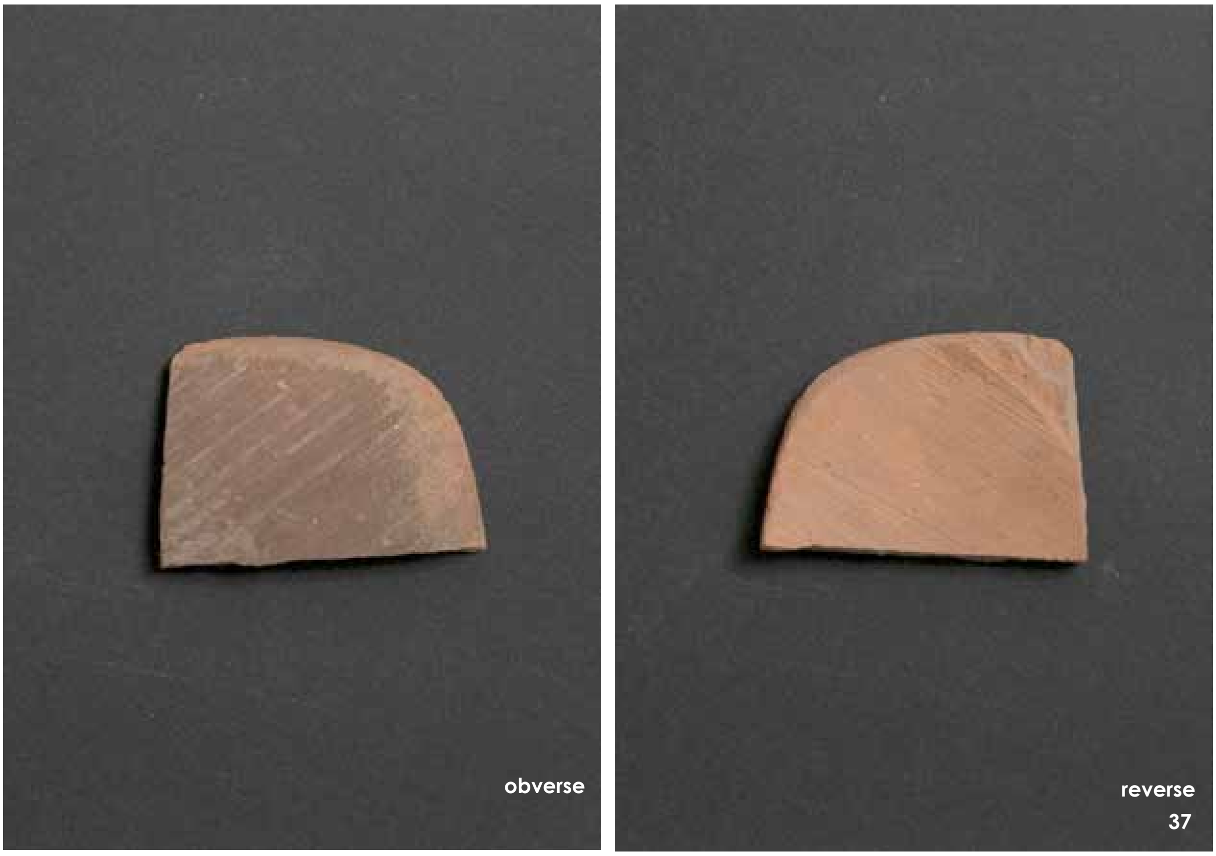


Figure 5.23 Reused potsherds (ca. 1/1)

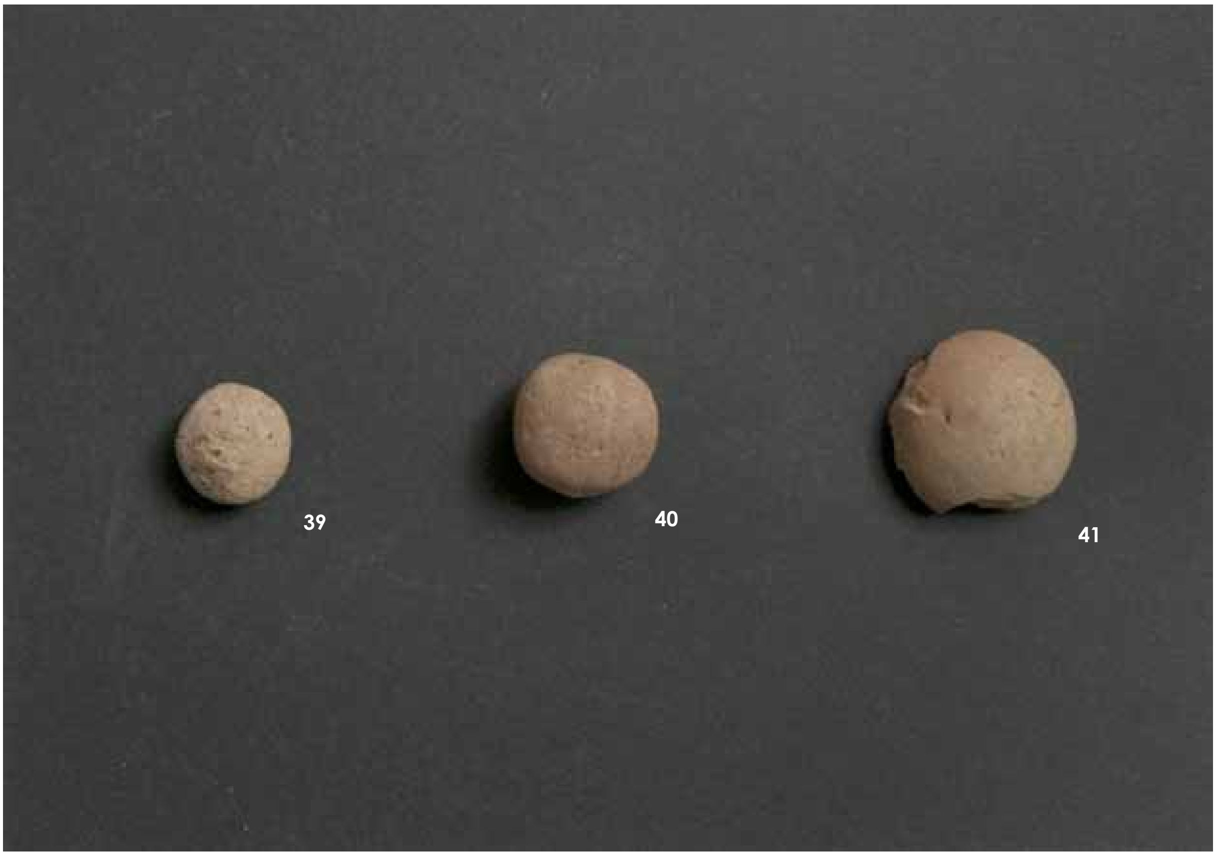


Figure 5.24 Terracotta balls (ca. 1/1)



Figure 5.25 Terracotta objects (ca. 1/1)



Figure 5.26 Steatite and faience Beads, and silver rings (ca. 1/1)



Figure 5.27 Pounfingstones (ca. 1/1)



Figure 5.28 Stone querns (ca. 1/1)



Figure 5.29 Stone quern and ball (ca. 1/1)



Figure 5.30 Stone balls (ca. 1/1)



Figure 5.31 Bone points (ca. 1/1)



Figure 5.32 Bone objects (ca. 1/1)



Figure 5.33 Copper objects (ca. 1/1)

CHAPTER 6

AMS RADIOCARBON DATING

BY PALEO-LABO AMS DATING GROUP

1 INTRODUCTION

This report shows the results on radiocarbon dating of samples from Girawad site using the AMS (Accelerator Mass Spectrometry) technique.

2 SAMPLES AND METHODS

Table 1 shows the data of sample and pre-treatment.

Pre-treatments for AMS measurements were performed at Paleo-Labo and 14C concentrations were measured with Paleo-Labo AMS system (Compact AMS, NEC, 1.5SDH).

Conventional radiocarbon ages were determined from the 14C/12C ratios after normalizing the isotopic ratios of 13C/12C to δ13C = -25.0 per mil and then calibrated to get calendar ages.

3 CALENDAR AGE CALIBRATION

Radiocarbon age is not equivalent to calendar age because of isotope fractionation, changes of 14C density in atmosphere caused by changes of cosmic ray intensity and geomagnetic field in the past, and the difference between Libby`s half-life 5568 years and practical half-life 5730±40 years. In order to convert radiocarbon age to calibrated calendar age, we performed calibration of radiocarbon age.

Calibration was performed with the software OxCal4.1 (Data set : IntCal09) and the range of calibrated result was calculated with the probability method of OxCal4.1. The 1σ range corresponds to 68.2% confidence limits for 14C dating error and the 2σ range corresponds to 95.4 % confidence limits either. In Table 2, the percentage in parentheses presents that calibrated results are in the range with the probability. The underlined range is the most probable range. In Figure 1, the curve on the vertical axis presents probability distribution of radiocarbon age and the dual curve presents calibration curve.

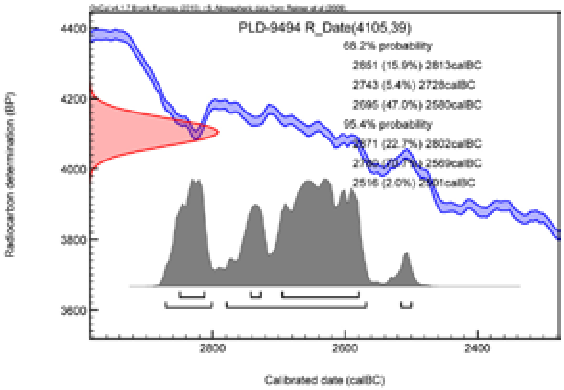
4 RESULTS

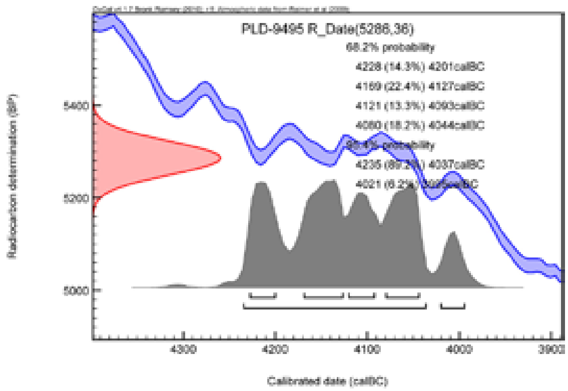
Table 2 shows δ13C values for correction of isotope fractionation, conventional radiocarbon ages which are not rounded for calibration, conventional radiocarbon ages which are rounded, and calibrated results. Figure 1 show the calibrated results.

Conventional radiocarbon age presents years before AD1950. Radiocarbon age was calculated with Libby`s half-life 5568 years. Errors (±1σ) were calculated from statistical errors of 14C counting and standard deviations in the measurements. The range of errors presents that radiocarbon age distributes in this range with 68.2% probability.

PLD. No.	*Sample no.*	*Sample data*	*Pre-treatment*
PLD-9494	Sample no. 07-012 Tr. 44 / Pit 35	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl: 1.2N,NaOH:0.1N,HCl:1.2N)
PLD-9495	07-013 Tr. 28 / Pit 23	Sample type: Carbonized wood Condition: dry	Acid-Alcali-Acid cleaning (HCl: 1.2N,NaOH:0.1N,HCl:1.2N)

No.	*Lab. no.*	*Season*	*Trench/ Feature*	*δ13C (‰)*	*Date for caribration (yrBP±1 σ)*	*C-14 dates*	*Caribrated dates*	
							1 σ	2 σ
1	PLD-9494	2006-07	44 Pit no.35	-15.05±0.38	4105±39	4105±40	2851BC(15.9%)2813BC 2743BC(5.4%)2728BC 2695BC(46.9%)2580BC	2871BC(22.7%)2802BC 2780BC(70.7%)2569BC 2516BC(2.0%)2501BC
2	PLD-9495	2006-07	Pit 23	-16.35±0.36	5286±36	5285±35	4228BC(14.2%)4201BC 4169BC(22.4%)4127BC 4121BC (13.3%)4093BC 4080BC(18.2%)4040BC	4235BC(89.1%)4037BC 4021BC(6.3%)3995BC





References

Bronk Ramsey, C. (1995) Radiocarbon Calibration and Analysis of Stratigraphy: The OxCal Program. *Radiocarbon*, 37, 425-430.

Bronk Ramsey, C. (2001) Development of the Radiocarbon Program OxCal. *Radiocarbon*, 43, 355-363.

Nakamura, T. (2000) Basic of Radiocarbon Dating. *14C Ages of the Japanese Prehistory*, 3-20. (in Japanese)

Reimer, P.J., Baillie, M.G.L., Bard, E., Bayliss, A., Beck, J.W., Blackwell, P.G., Bronk Ramsey, C., Buck, C.E., Burr, G.S., Edwards, R.L., Friedrich, M., Grootes, P.M., Guilderson, T.P., Hajdas, I., Heaton, T.J., Hogg, A.G., Hughen, K.A., Kaiser, K.F., Kromer, B., McCormac, F.G., Manning, S.W., Reimer, R.W., Richards, D.A., Southon, J.R., Talamo, S., Turney, C.S.M., van der Plicht, J. and Weyhenmeyer C.E. (2009) IntCal09 and Marine09 Radiocarbon Age Calibration Curves, 0–50,000 Years cal BP. *Radiocarbon*, 51, 1111-1150.

CONCLUDING REMARKS

by Vasant Shinde

The site of Girawad is extremely interesting as this appears to be close to the eastern periphery of the Hakra Culture. This is the second Hakra Culture site in Haryana after Bhirrana which has been excavated systematically. Only one Carbon 14 dates is available, which is close to our speculation it could be dated to the late Fourth Millennium BC on the basis of its comparison with Bhirrana. The data on architecture from Bhirrana and Girawad suggests that the Hakra culture people lived mostly in pit-dwellings, which were shallow. Each pit-dwelling consisted of other features like storage pit, garbage pit, water pits and storage pots. It appears that the open space available in each cluster was used for carrying out some domestic activities. Similar kinds of clusters are built by casual labourers in parts of central India and the Deccan region even today. The discovery of pit-dwellings and also traces of mud-brick structures at Girawad is significant as it indicates that both pit-dwellings and permanent structures in the form of rectangular mud-brick architecture were in use simultaneously. There is an indication from Girawad that the Hakra Culture was a class-structured society. The pit-dwelling complexes excavated at Girawad were most probably occupied by craftsmen, mainly potters as the discovery of three pottery kilns would indicate. The area on the other side of the road where the remains of mud-brick structures were noticed could have been occupied by higher ranked people.

The discovery of three pottery kilns in such a small excavated area at Girawad suggests that it was one of the major pottery manufacturing sites of the Hakra culture in the middle to late of the Fourth Millennium BC. It is quite likely that Girawad supplied pottery to a number of other small sites located in its proximity. A few sherds of the Periano Reserved ware, usually confined to the Baluchistan area in the west, and now found at Girawad suggest that the people of Girawad had cultural or trading contacts with far-off regions.